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HIPPOPATHOLOGY:
A
SYSTEMATIC TREATISE
ON
THE DISORDERS AND LAMENESSES
OF
THE HORSE,
WITH THEIR MODERN AND MOST APPROVED
METHODS OF CURE;

EMBRACING THE
DOCTRINES OF THE ENGLISH AND FRENCH VETERINARY SCHOOLS; THE OPINIONS
OF THE LATE PROFESSOR COLEMAN, DIRECTOR GERARD, HURTREL D'ARBOVAL,
AND OTHER BRITISH AND FOREIGN VETERINARIANS.

BY
WILLIAM PERCIVALL, M.R.C.S.,
LATE VETERINARY SURGEON IN THE FIRST LIFE GUARDS; AND
AUTHOR OF 'LECTURES ON HORSES.'

VOL. III.

"A righteous man regardeth the life of his beast."

LONDON:
LONGMANS, GREEN AND CO.,
PATERNOSTER ROW.

1876.

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ADVERTISEMENT.

THE VAPOUR-BATH FOR HORSES, REPRESENTED IN THE FRONTISPIECE.

P. W.
P. 11
ALTHOUGH the remarks incidentally made in allusion to the efficacy of a warm bath (at page 61), which took their origin from an interesting experiment performed by the well-known inventor of the Patent Syringe, Mr. Read, in the presence of myself and Mr. Cherry, P.V.S. to the Army, are such as to lead to the belief that no long time was likely to elapse before so desirable an object might be attained, yet I must confess I was not prepared for its accomplishment and introduction into practice at so early a period as that at which I am now writing. I cannot do more here than briefly explain in reference to the plate, the nature and operation of the apparatus used for the purpose by Mr. Field, at whose infirmary the bath may be seen; further particulars concerning it may be learned from the account published in *The Veterinarian* for January, 1843.

a represents a boiler originally erected for the purpose of supplying the infirmary with hot water; c is the main pipe issuing from the top of the boiler, receiving the steam, and conducting it, when not required for other purposes, into either a flue or the open air at b; e and f are branch-pipes from the main one (c), f being that which conducts the steam into a worm (h), winding through a condensing trough (g); e the branch-pipe which conducts the steam (prevented by stop-cock from going in the other direction) into the bath; the place of admission (n) being on one side, close to the floor, at a point intermediate between the horse's fore and hind feet while standing in the bath, with his head outside; m is the bath, being a horse-box, such as is used for embarking horses on board of ship, with the addition of a lining of flannel, a roofing of hoops and tilting, and curtains over the doors, front and back, to prevent the escape of steam. The box being placed upon wheels, serves, besides being used as a bath, for the transport of sick or lame horses; and having doors at both ends, and a movable platform for the horse to walk in upon, is in general entered without any great deal of unwillingness.

CONTENTS

OF VOLUME III.

	PAGE		PAGE
Injuries of the Brain	5	Constitutional Disordr	162
Concussion	ibid.	Discharge from the Nose	164
Fracture of the Skull	6	The Ulcerative Stage	ibid.
Loss of Substance of the Brain .	9	An Analysis of the Nasal Discharges	166
Staggers	10	Vascular Injection or Inflammation	
Arachnoiditis	12	of the Schneiderian Membrane	ibid.
Coma, or Sleepy Staggers	15	Thickening of the Membrane . .	167
Encephalitis — Phrenitis — Mad		Ulceration	ibid.
Staggers	16	Miliary Ulceration	169
Apoplexy	22	Enlargement of the Submaxillary	
Vertigo—Megrims	26	Lymphatic Glands	170
Paralysis	31	Tumefaction of the Ali Nasi . . .	171
Tetanus	45	Predilection of the Disease for the	
Spasm	64	left or near Side of the Head .	172
Conjunctival Ophthalmia	72	DIAGNOSIS	173
Opacity of the Cornea	75	VARIETIES	180
Periodic Ophthalmia	77	Acute Glanders	182
Cataract	102	Inoculated Glanders	181-183
Glaucoma	126	Course of Acute Glanders	182
Amaurosis	128	Typhoid Glanders	183
Worm in the Eye	133	Pulmonary Glanders	184
Fungus Hæmatodes	139	Epidemic and Endemic Glanders .	185
Ossification	146	Sub-acute Glanders	186
Melanosis	147	Chronic Glanders	187
Laceration of the Eyelid	148	Insidious Glanders	188
Enlargement of the Caruncle . .	149	The Distinction between Chronic	
Fistula of the Eye-pit	151	Glanders and Nasal Gleet . . .	192
Disease of the Lachrymal Passages	154	Frauds practised with Glandered	
Tumours and Fungus of the Orbit .	158	Horses	193
		CAUSES	195
		Predisposing Causes	ibid.
		Exciting Causes	198
		Opinions of Authors (ancient and	
		modern) thereon	198-217
		Classification of Exciting Causes .	218
		CONTAGION	ibid.

Glanders.

General Observations	159
Derivation of the word "Glanders"	161
Definition	162
SYMPTOMS	ibid.

CONTENTS.

	PAGE
MIASM OF THE STABLE . . .	240
OTHER CAUSES . . .	248
SEAT AND NATURE OF GLANDERS . . .	252
Opinions of Authors (ancient and modern) thereon . . .	253-279
Authors' Opinions . . .	280-302

Farcy.

Derivation of the word "Farcy" .	303
Definition . . .	ibid.
Varieties . . .	ibid.
Symptoms . . .	304
The general Swelling . . .	306
The First and Second Stages . .	307
The Matter discharged from Farcy Pustules . . .	ibid.
The Third Stage . . .	308
The Parts most obnoxious . . .	309
Button Farcy . . .	311
Swelling of the Lymphatic Glands .	ibid.
Diagnosis . . .	312
Progress . . .	313
Prognosis . . .	315
CAUSES . . .	316
SEAT AND NATURE . . .	318

Treatment of Glanders and Farcy.

PROPHYLACTIC TREAT- MENT . . .	323
THERAPEUTIC TREATMENT OF GLANDERS . . .	327
Treatment adopted by ancient and modern Veterinarians . . .	327-331

	PAGE
The General Treatment . . .	331
Sulphate of Copper . . .	332
Sulphate of Iron . . .	333
Cantharides . . .	334
Iodine . . .	335
Dinioidide of Copper . . .	ibid.
Result of Author's Observations and Experience . . .	336
Tabular Abstract of Cases of Glanders and Farcy . . .	337
Barytes . . .	339
Recovery under the use of . . .	ibid.
Recovery and Amendment under the use of Stavesacre . . .	340
Recovery under the use of Balsam of Copaiba . . .	ibid.
Recovery under the use of Cubeb Pepper . . .	341
Recovery and Amendment under the use of Cayenne Pepper . . .	ibid.
Injections . . .	342
Creosote . . .	ibid.
Fumigations . . .	344
Counter-irritation . . .	ibid.
Treatment of the Enlarged Glands .	ibid.
Cool and Pure Air . . .	345
THERAPEUTIC TREATMENT OF FARCY . . .	345
Antiphlogistic Treatment . . .	347
Walking Exercise . . .	348
Diet . . .	ibid.
Medicine . . .	349
Tonics . . .	350
Sulphate and Dinioidide of Copper, Sulphate of Iron, Mercury, Iodine, Cantharides, Barytes . . .	ibid.
LOCAL TREATMENT . . .	351

HIPPOPATHOLOGY.

SECTION XVI.

DISEASES OF THE BRAIN AND NERVES.

INJURIES OF THE BRAIN.
CONCUSSION.
FRACTURE OF THE SKULL.
LOSS OF SUBSTANCE OF THE
BRAIN.
STAGGERS.
ARACHNOIDITIS.

COMA.
ENCEPHALITIS—PHRENITIS.
APOPLEXY.
VERTIGO OR MEGGRIMS.
PARALYSIS.
TETANUS.
SPASMS.

THE smallness of the encephalon or brain of the horse, conspicuous even when estimated by the bulk of his own body, yet more so when compared with the human encephalon, together with the predominance in its composition of the medullary over the cineritious or cortical ingredient, are the physical reasons apparent for the limitedness of the animal's intellectual faculties: those agencies which, while their fruitful development constitutes man's supremacy, and immeasurably contributes to his power and enjoyment as a created being, heavily and sorrowfully add to the evils which he in common with all flesh is heir to. One great proof—if any were wanting further than those furnished by every-day observation—of the absence of mind or understanding in the brute, is derivable from the pathological fact of any such thing as *insanity* being unknown in veterinary practice. “Les causes éloignées,” says D’Arboval, “les morales surtout, qui ne manquent pas d’influence sur l’homme, sont inconnues ou ne sont pas appréciées dans les animaux.” Although exempt, however, from disturbance by any passions of a social or moral nature, the encephalon of the animal, the same as that of a man, may become affected through *sympathy* with other organs—through what we are now taught to call

“reflex nervous action”—and in particular with the stomach: as, in a man, indigestion may cause headache, or a blow upon the stomach excite sickness, and even death; so in a horse, an overloaded stomach may give rise to a cerebral disorder, well known to veterinarians and others by the designation “stomach-staggers:”* the symptoms of which sometimes so nearly resemble those of organic disease of the brain itself, that, but for the history attached to them, the seat of disease might be altogether mistaken.

Traumatic tetanus is another example of functional derangement and reflex nervous irritation: a horse receives a prick in one of his feet from a nail, and locked-jaw is the consequence of it.

On the diseases of the brain and nerves, and their effects on the different organs and structures of the body, the late successful investigations into the anatomy and physiology of the nervous system have cast lights, enabling us very much better to comprehend their nature, and directing us to a more defined and rational mode of practice. We now know for certain, that the cerebrum is the seat of sensation and volition, the source of what intuitive reason or sagacity the animal possesses; and, consequently, that any impairment of these functions is to be imputed to disease or derangement of, or reflected upon, that division of the brain. The spinal marrow being in reality but a process or continuation of the cerebrum, sensation and volition are conveyed to and from the cerebrum through the body, the same as those impressions would be through the medium or intervention of any large nervous trunk. Removal or destruction of the cerebrum annihilates all sensation and voluntary power, but not immediately, or consequently, organic life; for signs of that are still demonstrable in the brainless body, even in the highest orders of animals; though this remnant of vitality is supportable only for a time; one, and that the grand system—the *primum mobile*—being destroyed, the others are unable of themselves to carry on the functions necessary to the continuance of the vital property. Section or injury of the spinal marrow will only deprive of sensation and motion such parts as derive their nerves from it below the part divided, injured, or compressed; the

* Described in section x, vol. ii, page 195.

same as division or compression of a nerve affects with paralysis only such parts as its ramifications are dispersed upon.

Again, Sir Charles Bell has proved to us, by a series of most interesting experiments, and the facts have since received the confirmation of pathological observation, that there are nerves for sensation and nerves for volition of motion; and that, although for the sake of convenience of distribution the sentient and motor fibrillæ are commonly enclosed within the same tunic, there are instances in which they are altogether separate. We now perceive the reason why, in cases of paralysis, sometimes sensation is lost, sometimes only the power of moving the part, at other times both faculties are gone: all depending upon the injury done to the sentient and motor nerves or to their sources, which latter being the same or very near together, and the nerves themselves being commonly within the same envelope, accounts for both feeling and motion, ordinarily, being destroyed in paralytic parts.

We now also know, that no act of volition can take place without a previous sensation:—how could my mind give the mandate for extending my arm, unless it were conscious of its being already flexed? And by parallel reasoning, morbid actions of parts we shall find to be mostly dependent upon morbid sensations or impressions. Stringhalt, which may be compared to chorea, both being affections in which the will has in a measure lost its control over the voluntary muscles, may either proceed from something existing in the spine, along the course of the nerves, or in the affected limb itself, or even, for aught I know, in some remote part of the body: the doctrine of “reflex nervous action” has so much enlightened and extended our views of spasmodic and convulsive diseases, that we no longer confine our researches to the brain or spinal marrow, or even to the trunks of the nerves, to discover the source of their origin.

A most important field of study towards the due understanding of nervous diseases and derangements is presented to us in those new departments of the nervous system, the *respiratory* of Sir Charles Bell, and *excito-motory* of Dr. Marshall Hall, which were formerly confounded with others, or rather of whose distinct existence we before possessed no knowledge at all.

Sir Charles Bell, in the course of his physiological investigations, discovered that the nerves concerned in the functions of respiration were not to be classed with the sentient and voluntary systems, or even with the ganglionic, but, on the contrary, formed by themselves another, a distinct system; and that their seat of power and action was the medulla oblongata.

Since this, Dr. Hall has developed what he calls his "true spinal" or "excito-motory" system, and insists that Sir Charles Bell's "respiratory" must come included within it. And, further, that the *primum mobile* of the respiratory actions is not seated in the brain, but in the nerves; that the act is an "excited" one, arising from the presence and stimulus of carbonic acid; and that the medulla oblongata is but the centre or medium through which the excitation or impression is conveyed to the motor nerves distributed to the respiratory muscles.

This is not the place to enter into physiological inquiry. My object in touching the subject thus lightly has been to impress upon the mind of the scientific veterinarian the absolute necessity of the study and comprehension of these new views, before he can understand a pathology avowedly grounded upon them.

Notwithstanding the brain is the source of all sensation, yet, singular enough, in itself, it is a part entirely devoid of feeling: in experiments on living animals its substance has been pricked, cut, lacerated, burnt even, without the slightest manifestation of pain or sensation.

Very different, however, are the effects of *pressure*. Impressed in a vertical direction, even but slightly, the animal is prostrated, deprived of sense and motion; although the same degree of pressure in a *lateral* direction produces no such effects. These are facts which will prove of the greatest service to us when we come to treat of injuries to the brain; they will enable us to comprehend why, as in Mr. King's case,* portions of brain may even be removed without ill consequences; while a portion of bone simply depressed upon the organ might cost the animal his life.

* This rare and curious case will be found related at page 9.

INJURIES OF THE BRAIN.

These are not near so frequent as might be imagined. Not but horses' heads receive injuries enough from falls and blows to often occasion fracture and depression of bone, but that the walls of the skull are constructed with so much wisdom and foresight (being provided with barriers and additional substance in such parts—the occiput and temples—as are most exposed), that the collision must be heavy indeed to produce fracture, and without fracture we can hardly in such parts as these suppose a case of depression: all that results, nineteen times out of twenty, from falls backward, being a degree of

CONCUSSION,

producing transient fright and giddiness noticeable only at the time.

Now and then, however, although nothing more than some vertiginous sensations may occur at the moment, an attack of phrenitis, at a more or less distant interval, will ensue from a fall of this kind.

Eight years ago, a blood black mare, the property of an officer of the Life Guards, had been ridden by his groom behind him from the Regent's Park to Norwood, where in the act of shying and rearing, she was pulled backward by her rider, and fell upon the back of her head. She was ridden home by the groom, nothing appearing to ail her: the same night, however, she appeared dull and unwell; the next day she showed symptoms of phrenitis. As an instance of the worst effects of concussion, I cannot find anything equal to the following very interesting case, sent to *The Veterinarian* for 1834, by Mr. Cheetham, veterinary surgeon, Edinburgh.

A cart-horse was so much injured by a fall, that it was thought he would never rise again. He lay in a prostrate position, hardly discernibly breathing, and so continued for about half an hour, during which time the bars of his mouth were cut, but with little effect. He was then so far raised up as to enable persons to bleed him; and when he had lost what was conjectured to amount to five or six quarts, by the aid of several men he was got upon his legs, and supported into the stable. At this period Mr. C. arrived. His

pulse was 40. His head drooped as if he had lost all sensation. Mr. C. ordered him to be put in slings, and to have hot fomentations applied to his head and neck : this, giving relief, was persevered in for twelve hours. By way of experiment, Mr. C. took a sponge filled with cold water, and wetted the head with it, which, singularly enough, caused the former symptoms of coma to return. From this, Mr. C. infers, "it would seem that *warm* water should always be had recourse to in injuries of the brain." "In this case there seemed to be concussion of the organ : what confirms this opinion, is, that the masseter muscle had been contused, as appeared by the swelling afterwards. Purges were now given ; and when the fomentations had lost their power, mustard was applied extensively on the superior part of the neck. This gave pain, and caused him to throw his head about in every direction for the space of an hour. No further excitement could be produced during the same evening by the re-application of the cold water. I now had the mustard washed off, and ointment of cantharides substituted, and bled him to the amount of two quarts ; when his pulse became imperceptible. The following morning the blister was re-applied, not having acted : the pulse was 60, and full ; the other symptoms had not improved. I again bled him till I could perceive no vibration of the maxillary artery, at which period I had obtained six quarts : $\frac{3}{4}$ ij of linseed oil were then administered. He took through the day a small quantity of bran-mash and hay, but still kept lowering his head into the manger unless excited. In the evening the pulse was 60, and it had gained strength ; I, therefore, abstracted three quarts of blood. Clysters had been given from the first at intervals of a few hours. His bowels became relaxed, and continued so for two days. The action of the blister now commenced, and my patient exhibited favorable symptoms, such as regaining the use of his extremities, and keeping his head erect. Through the whole of the case, one good symptom remained, viz., that of the iris retaining its motion. On the second day of the purging he was released from the slings ; he walked about with freedom. Pulse still 60. When the purging ceased, another draught of oil was given, and in the course of a week his pulse returned to the natural state. He received gentle exercise for the space of another week, and then went to work, where he has continued as before the accident. It would, perhaps, appear, in the foregoing case, that the medulla oblongata was the part of the brain that had been injured (concussed ?)."

FRACTURE OF THE SKULL.*

This is a rare accident among horses. Not that causes are wanting for it, for in violent hands the animal too often receives a blow upon the head ; but that the cranium is so small that

* The same subject is treated on, but in reference to the *bones*, in vol. i, page 258.

it is not often the part struck ; and that nature has so defended those parts of it likely to be so, that, as was observed before, a blow must be very severe indeed to have the effect of fracturing them. The common and almost only accident of the kind we meet with, is fracture of the basis of the skull ; and the way in which it occurs is this :—the horse either is pulled or falls backward ; the vertex or summit of the head receives the blow, the shock or force of which is transmitted to the basillary process at the base of the skull, and that, from its comparatively insubstantial, fragile nature, being the weakest part, becomes the part broken. In very severe falls of this kind, the condyloid processes of the occipital bone, also in a situation to receive the impetus of the shock, in like manner, though comparatively substantial and strong in their composition, sustain fracture. It is not the fracture, however, that is to be dreaded in these cases so much as the consequences of it, hæmorrhage in particular, together with the effects of the tremendous concussion which in general attends such a fall.

Blood-vessels will be liable to give way in any part of the brain ; those, numerous and large, about the base, contiguous to the seat of fracture, will be almost sure to become ruptured. The symptoms will of course vary in their nature and intensity with the kind and degree of the mischief done ; the faculties of motion and sensation will be more or less impaired, should not death itself immediately result ; the senses also, one or more, will probably be lost or disturbed. By the parts affected, and by the extent to which they are affected, must we form our opinion of the nature of the case, as well as our prognosis. Indeed, in respect to the latter, that in general is but too evident. Commonly the animal is found down, unable either to rise or stand without assistance. Should he still retain feeling, and be in possession of his senses, and there be means nigh or at hand of treating him, remedies may be tried upon him ; but when he has to be removed upon some drag or carriage to any distance, he will in general do himself so much more mischief by struggling before he has arrived at his place of destination, that his case will probably be rendered yet more hopeless than it was in the first instance : fresh hæmorrhage

will be likely to ensue, and may prove fatal, even when, before the struggling had ensued, hopes of recovery had been entertained. On this account, it is of vast importance, when the case holds out prospects for treatment, to house the animal somewhere close to the place where the accident has occurred. In general bloodletting will be proper; though the symptoms from loss of blood or nervous depression may be such as not only positively to forbid this evacuation, but even to demand the exhibition of stimulants. My estimable and never-to-be-forgotten deceased friend, Mr. John Field, whose extensive range of practice brought such cases as these within his notice, has recorded two* which are well worthy our attention :

Oct. 27th, 1832.—A brown horse belonging to Col. D., on the road to Windsor, started opposite Knightsbridge Barracks, in consequence of a kite falling upon his head, and ran as far as Kensington, where he slipped up on the stones, and never rose again. He was brought to Mr. Field's infirmary on a brewer's dray. He possessed common sensation, could struggle, and was sensible; but was unable to rise, and to stand when raised in the slings. Bled largely, and a purge exhibited. Pulse 48. *Oct. 28th.*—Pulse 90. More irritable; is able to turn over; neighs when persons approach him; has passed some hard fæces; pupils do not contract at the approach of a candle; pulse more feeble; restlessness; increased struggling; occasional tremor of limbs; sweats profusely; respiration much accelerated. Aloes ʒiv given. Catheter introduced, and some urine withdrawn. Raked and clystered. Towards evening became much weaker, and died about two o'clock the following morning.—Examined same afternoon. Some effusion of lymph upon the right side of the cranium, occasioned by chafing in throwing the head about; but no fissure or fracture. On removing the calvarium the dura mater was observed distended with black blood upon both hemispheres. The upper part of the occipital bone being struck, the neck suddenly dropped, evidently from some detachment; and on further examination it appeared that the basilar process must have been fractured by the accident, and the vessels on its surface ruptured. The brain was very sanguineous: its veins were excessively distended. The lungs and other viscera were undergoing very rapid change.

Sept. 17th, 1821.—A bay gelding, in being led out of Col. R.'s stable-door, hung back from the collar, reared up and fell backwards upon the pavement. From this time he was unable to stand without support of men on one side, the wall sustaining the other. No appearance of fracture about the cranium at this time. His limbs were all paralytic. Eyes very turgid; senses all perfect, excepting no power over the extremities; breathing quiet. With

* Among his Posthumous Cases.

some difficulty he was dragged into a coach-house, plentifully littered—bled to about twelve quarts, took aloes comp. ℥xij, and a stimulating enema every second hour; and this lotion, viz. muriat. ammon. ℥ss, acet. distill. ℥iv, sprts. vini ℥ij, aquæ lbij, to be applied frequently to the head. Sept. 18th.—Still lying. Pulse full and frequent. V.S. ad lbij.—continue lotion. Was turned upon the off side, having lain long upon the near. Died at twelve o'clock. EXAMINATION.—A piece of skin corresponding to the broad prominence near side of atlas was found stripped off its cuticle. The basiliary process of the occiput was broken in two; also both condyloid processes were broken off short by sudden and extraordinary pressure of the atlas against them; this pressure was so great, that a portion of the muscle so compressed had forced out a part of the thin plate of the atlas.

A case precisely similar occurred at Mr. Field's farm; save in that the two condyloid processes and the basiliary were broken off in one piece. This horse experienced perfect paralysis of all parts posterior to the occiput, and died in a few hours after the accident. Immediately after receiving the injury he could in some measure extend his limbs, and still possessed sensibility in several parts of the body, as was evident by his endeavouring to exert himself when a whip was applied; although he could only stand while propped against a wall.

* * * The senses of vision, tasting, &c., also the common feeling in such parts as derived their nerves from the brain anterior to the seat of injury were observed by Mr. Field to be very acute: "a circumstance," he adds, "that may serve as a diagnostic between the effects of an accident of this kind and those of any affection of the brain or its membranes."

LOSS OF SUBSTANCE OF THE BRAIN.

Now and then, in sheep affected with hydatids in this organ, considerable loss of substance of the cerebrum has been observed, and without any apparent derangement or even inconvenience from it: something very similar has come under the observation of my old and excellent friend, Mr. King, of Stanmore, and has been recorded by him in *The Veterinarian* for 1831, from which I here extract it.

December 1st—now six years past—a horse belonging to Mr. Geo. Elmore was sent to my stables with a very small punctured wound on the head, apparently caused by a nail or the sharp-pointed prong of a fork, through the lower edge of the right temporal muscle, and which on examination with a small surgeon's probe, proved to pass through the parietal bone, just above the coronary suture. It had the appearance of having happened not very recently. I made an extensive crucial incision through the scalp, quite down to the bone, directly over the puncture, and applied blisters to the surround-

ing parts; gave physic, and bled.—2, Repeat the bleeding, and give an aperient ball.—3d, Bleeding and ball repeated. In the evening the bowels freely acted on.—4th, External wound suppurating kindly, and all the functions going on regularly. Repeated the blisters. All night a degree of stupor was observed. Repeat the bleeding.—5th, Delirious, and requiring much constraint.—6th, This morning applied a trephine, making the original puncture the centre, and expecting on the removal of the bone and division of the membranes, a flow of some fluid. Nothing, however, followed. I then extended the opening through the membranes to the full extent of the opening in the skull, and, looking into the head, was surprised to find almost an empty cavity: nearly two thirds of the cerebrum on that side were gone, and what remained at the back part of the skull was covered with a dry black coating, presenting an appearance much like the pigmentum nigrum when the humours of the eye have been evacuated. The horse died that night. Thinking it was a case likely to occur again, I made no inquiry, which I now much regret.

STAGGERS.

Disease of the brain and its membranes constitutes one of those branches of hippopathology which has undergone cultivation inferior to most others: as one reason for which we may adduce the comparative infrequency of its occurrence; as another, the acknowledged trouble and difficulties attendant on post-mortem examinations of the encephalon of the quadruped. That the horse's brain is on occasions the seat of congestion or plethora, as well as of inflammation, we have evidence enough both in living and in dead subjects who have evinced symptoms of cerebral disorder: sufficient cases stand likewise on record to prove that the organ is obnoxious to many or most of the same changes in appearance and structure, as have been from time to time detected by diligent examinations into the morbid human brain.

In common, we hear of but two diseases of the brain in the horse: one is *megrims*—the other, *staggers*. The first I believe to be an affection admitting of being sufficiently characterised to stand by itself; but under the last, which must be regarded as a generic appellation, may be comprised coma, apoplexy, and phrenitis: in other words there are to be met with in practice, besides stomach staggers, "sleepy staggers," "apoplectic staggers," and phreutic, or "mad staggers."

Encephalic inflammation may confine its attack either to the membranes or to the substance of the brain, or both together may be affected by it: even in this latter case the inflammatory action probably arises in one, and afterwards extends to the other, though still raging in the part first attacked with greater violence than in that which has become secondarily, or sympathetically, or by contiguity, affected. From all the circumstances connected with mad staggers, there appears reason to believe that the membranes are mostly the principal or primary seat of the inflammation, and that the brain to the extent that it is affected, if at all, is but secondarily so: not that we recognise any symptoms during life that we can rely upon as safely directing us either in one case or the other, but that the appearances after death are commonly such as especially denote membranous disease. There is no symptom recognised even in human medicine as perfectly diagnostic between the membranous and cerebral affections: the former is said to be "marked by acute pain, delirium, and convulsions; the latter by muscular contractions, alternating with and followed by paralysis;" but the best physicians acknowledge the difficulty they feel in drawing a correct diagnosis. The usual consequence of inflammation of a serous membrane is effusion of a straw-coloured fluid, which we in common language denominate "water;" and every practical veterinarian knows that nothing is so common as, after death from mad staggers, to meet with the ventricles, and sometimes the cavities within the olfactory nerves as well, filled with this water; either in a state of beautiful pellucidity, or else stained with blood, or perhaps turbid, from admixture of pus: these cavities, I need not add, being lined with pia mater. Now and then water is found included between the membranes themselves, stagnating upon the surface of the brain. Not, however, that this effusion is to be considered as an infallible sign of inflammation having existed; for, as has been observed by pathologists of unquestionable reputation, "inanition and repletion both dispose to effusion within the head." When the inflammation has pervaded the brain itself, its substance, when cut into, will display spots of blood no larger than the pricks of a pin or needle;

and these will be more or less numerous and extensive according as the inflammatory action has raged with more or less violence, and has been partial or general. The plexus choroides, too, are often found turgid with blood. Though this may be said to constitute the ordinary state of the brain of the horse dying of encephalitis, yet it is right we should observe that several other anormal appearances have been recorded as connected with mad staggers, and on authority which we have no reason to call in question.

SOFTENING OF THE BRAIN is by no means an uncommon result of inflammation in it, but, I believe, rather of that in a chronic than an acute form. Rarely, I believe, is the cerebral substance found indurated or firmer than natural.

DISCOLORATION.—In one instance I met with a remarkable *yellowness* of the cerebellum; the horse having at the same time considerable disease of the liver. Were the two alterations pathologically connected? Mr. Field mentions a case of discoloration of the corpora striata and septum lucidum.

PURULENT MATTER will form under active inflammation. Mr. Field gives an account of a case in which a large abscess existed in the posterior hemisphere.

ALBUMINOUS MATTER.—The same respected authority has left us the relation of another case in which thick layers of coagulable lymph were found in the lateral ventricles completely coating the thalami nervoreum opticom.

ARACHNOIDITIS.

In cases in which the seat of inflammation may be pronounced to be membranous, we learn from the closest pathological examinations, that the arachnoid membrane is in particular affected, or affected to that super-eminent degree to warrant us in characterising the disease as *arachnoiditis*; and as we have French veterinary authority for considering this as the most frequent proximate cause of staggers, perhaps it would be advisable here to transcribe from the same authority—M. Roupard—the account given of arachnoiditis. It is published in the *Compte Rendu*, for the year 1825, of the Veterinary School at Lyons.

M. Roupard lays it down as established, that acute idiopathic arachnoiditis

has its origin in lesion of the arachnoid membrane, the consequence of cerebral effusion. He considers that staggers most commonly arises from acute arachnoiditis, the result of which is hydrocephalus; that arachnoiditis may be either idiopathic or symptomatic; and that in the chronic form it has been described under the appellation of serous apoplexy, and on many occasions is present with that assemblage of symptoms which have been grouped together under the name of *immobilité*.

As the symptoms and pathological characters of idiopathic arachnoiditis, M. Roupard has given, irregularity in the appetite, obscure vision, conjunctive membranes injected, superficial veins turgid, hearing impaired, body tucked up; sometimes the mouth wide open and the tongue hanging out; temperature of the body now hot, now cold; pulse slow and oppressed, or else small, thready, frequent, irregular; dragging of the hind quarters; thrusting the head against the rack; rearing the fore-feet into the manger; restlessness; flinging himself about, and even backwards; head erected with wild stare, or jerking up and down; tremor of the limbs and tail; loss of vision and audition; sweatings; and, as death approaches, eyes fixed with convulsions. *Autopsy*.—Belly tympanitic; no traces of inflammation within the abdomen; pulmonary tissue crepitous; cerebral mass less consistent than in health; cerebral sinuses and superficial vessels filled with deep-coloured blood; lateral ventricles dilated from containing more or less limpid serosity, slightly citrine-coloured; the portion of choroid plexus floating in this fluid discoloured and sodden-like; the arachnoid rose-tinted, and displaying very perceptibly reddish spots.

In the above account the practitioner of experience cannot fail to recognise the characters of staggers: indeed, it tends to confirm the view here taken of the pathology of that disease, that it is essentially, in its acute and violent form, a membranous affection, the brain being but symptomatically or secondarily deranged.

D'ARBOVAL held the same opinion: “De toutes les phlegmasies cérébrales celles qui se trouvent le plus souvent réunies et qu'il est le plus difficile de distinguer, pour les considérer insolément, sont l'encéphalite et la phrénésie. Celle-ci,—qui serait mieux nommée *arachnoïdite*, est l'inflammation de la *membrane séreuse du crâne*; à laquelle se joint souvent celle de la meninge qui la recouvre, et celle de la substance encéphalique elle-même. Cette phlegmasie, ainsi étendue, est ce qui répond à ce que les vétérinaires et les hippiâtres ont désigné sous le nom de VERTIGE ESSENTIEL, pour le distinguer du *vertige abdominal*, que n'est que symptomatique.” (Vol. ii. p. 175.)

VATEL, in observing that inflammation of the brain is ordinarily accompanied by inflammation of the arachnoid membrane, and acknowledging how difficult it is, admitting them to have a separate existence, to distinguish between them, has laid down the following rules for our guidance: "Apoplexy appears to be generally characterised by sudden loss of power over the voluntary muscles, without spasmodic action. Inflammation of the brain is known by spasmodic action followed by slow and progressive, perhaps irregular and intermittent, paralysis. Arachnoiditis, by spasmodic action without loss of voluntary power."

So far from there being any paralytic tendency in mad staggers, we know that the powers of voluntary motion, while the paroxysm rages, are excited and increased to their utmost degree, although the sensibility, especially in the intervals between the fits, appears dead to all external impression, and the faculties of the organs of sense we know to be lost; at least, so it is with the eyes, and so we conclude it to be with the ears and other senses. This, then, it seems agreed constitutes the membranous inflammation; the substance of the brain itself exhibiting—to borrow the language of the great Cullen—"as in other analogous cases, a more chronic inflammation."

The CAUSES OF STAGGERS comprise any and every thing which has tendency to produce an overflow of blood upon the brain; such as plethora of body, inordinate exertion, sultry weather, and determination of blood to the head from peculiar conformation of parts or other cause. Horses at the middle or most robust period of life, in full or gross condition, with short, bull-like, straight necks, and but very inadequately or irregularly worked, are the common subjects of staggers. The disease may arise suddenly from a sort of *coup de soleil*. Soon after my father entered the Ordnance Service at Woolwich, it became customary to turn horses who had become low in condition, and stale upon their legs from work, from out of the Barracks at Woolwich into the Plumstead Marshes, to recruit their strength. During the months of July, August and September, no case was more common than an attack of staggers among these horses; which my father attributed to

the luxuriant pasture they were suddenly turned into—for it invariably loaded them with fat, and consequently plethorized their systems—combined with the dependent posture of the head, and *the sultry heat they were exposed to*; the marshes being places entirely destitute of shade. Over-ridden or driven horses are attacked on occasions with staggers, but not to the extent that over-fed horses are, without taking into the account the disease called *stomach staggers*. Concussion, compression, injury of the brain of any sort, may cause congestion or inflammation of it, and so produce sleepy or mad staggers. Mr. Apperley informs us that staggers and megrims are diseases little known in France; for which he accounts “by the lax state of the intestines the food of the French horses causes.”

COMA, OR SLEEPY STAGGERS.

The *coma* here intended to be introduced into veterinary nosology is the *coma somnolentum* of human medicine, which, as near as a disease in man can represent one in a horse, is the *sleepy staggers* of old writers on farriery.

SYMPTOMS.—In some instances the attack is sudden; the animal all at once becomes sleepy and comatose, and speedily after manifests delirium: in other cases, a dulness in his manner and sluggishness at his work, and disposition to drowsiness while standing still, is observed perhaps for some days before the horse is believed to be really suffering from illness.

WHEN COMA HAS SET IN, somnolency is the prevailing symptom. The horse, while standing, hangs his head and closes his eyes, and falls into a profound sleep, out of which, being suddenly awoke by unconsciously dropping down, by the slamming of a door or some other noise, or by some person nigh, he instantly starts up in a state of alarm, appearing as though he were frightened; soon, however, to relapse, unless his attention be again distracted by something, into his former state of stupor. While aroused, he will open his eyes, and look at, and perhaps recognise, things and persons around him, and will oftentimes take a mouthful of hay held out to him; at the same time, such is the overpowering influence of

somnolency upon him, that he will—as I have on many occasions witnessed—actually drop to sleep again with the hay in his mouth. At this time there is a laborious slowness of the respiration, with a tardy, full, soft pulse, and dilated pupils of the eyes. This drowsy fit is succeeded—sometimes attended—by a disposition to bore forwards and ram the head against wall or rack, or anything that happens to oppose its advancement; the patient, though thus arrested in his progress, still continuing, as he thinks, to advance, by performing a trotting motion with his fore-legs; or, he may stand still, boring his head with all his might, and breathing so hard and stertorously, that he alarms every person within his reach, lest each hard-fetched respiration should end in a throe of delirium and convulsion. These lethargic symptoms seldom continue any length of time: they may increase in intensity, and end in apoplexy and death; they more commonly are interrupted by a paroxysm of phrenitis or mad staggers. The bowels participating in the general torpor of the system, no dung is passed.

PATHOLOGY.—It appears to me, that during the comatose stage the blood-vessels of the brain must be in a state of surcharge or congestion; that this may increase and end in rupture, and extravasation or hæmorrhage, giving rise to apoplexy or sudden death; or that it may only prove the prelude to increased vascular action, and that inflammation, as I believe it commonly does, results from it. In fact, I believe it to be very analogous to what we observe taking place in congestion of the lungs.

ENCEPHALITIS—PHRENITIS—MAD STAGGERS.

Those who make use of the term *encephalon* to denote both the brain and its membranes, employ its derivative, *encephalitis*, to express inflammation affecting both those parts; and in this sense it is certainly the most appropriate name for the disease we are about to describe. Inflammation attacking the *encephalon* mostly does so in the acute form, producing that violent delirium pathologists have designated by the term *phrenitis*, and which veterinarians recognise as *mad staggers*: these are consequently nothing but appellations for a *symptom*, though

certainly one of a character so prominent and absorbing, that it is apt to draw off the attention from all the others. The nosology of mad staggers arising from inflammation is therefore *encephalitis*; and an advantage in adopting this in place of *phrenitis*, is, that it will apply to any form of inflammation, chronic as well as acute, and in which phrenitic symptoms, or mad staggers, may not happen to be present.

SYMPTOMS.—The approach of the phrenitic or mad paroxysm is foreboded by the animal waking out of his sleepy or comatose state, and staring about him with a fearful wildness and vacancy in his countenance; his breathing the while getting more and more quick and irksome, and the pulse rising with the respiration. Suddenly, he makes a frightful throe, dashing himself against rack or manger, or wall, or throwing himself down, and then lying breathing stertorously, with his eyes looking as if they were starting out of their orbits, no light at the time affecting the dilated pupils, nor he heeding anything that may be done or said to him. On other occasions the frantic animal will rear both his fore legs into the manger, and in this posture stand, with his head erected, for several minutes perhaps, no person daring to approach the while, lest he should unexpectedly spring up or reel round and fall upon the intruder. In a word, our patient is now “mad,” furiously so, in the worst sense of the word as applied to staggers, and how, or where, or upon whom he may in his delirious throes precipitate his body, is so uncertain, to himself as well as to everybody around him, that any approach to him, without extreme caution, or in a way in which ready escape is at hand, is fraught with imminent danger. Both the respiration and the pulse become during the fit very much excited, only remitting a little at such times as the animal remains stationary or quiet. As the disease increases, instead of lying quiet as before, in a state of apparent insensibility after a throe, convulsions will follow so quickly upon one another, that the patient will be kept in continual struggle, panting and perspiring, and perhaps foaming at the mouth, leading his attendants to believe he is not only phrenitic but actually *rabid*. This is a circumstance engendering so much apprehension and alarm, that not only is a prompt and decisive opinion demanded of the veterinarian in attendance, but at the

same time, such a line of conduct on his part as will at once convince his employers that he is right in his decision, that the case is

NOT RABIES BUT STAGGERS. There being no dog—or mad-dog at least—visibly connected with the case, is *primâ facie* evidence of it. And farther, the symptoms of the two cases are different: there being, according to Mr. Blaine, in rabid phrenitis, “not merely a frantic, but a decidedly *mischievous* disposition: the animal *purposely* attacking everything, living and dead: all around him—rack, and manger, and stall—are all laid prostrate.”

THE CAUSES—before enumerated and described, and here recapitulated—commonly are, in horses from their make or nature predisposed to an attack, high-feeding, hot weather or exposure to the sun, violent or over-exertion, or even the want of necessary exercise. It may succeed to a blow or fall upon the head. It may result from hæmorrhage within or upon the brain, or from some internal organic change or formation, such as tumours, &c.

PROGNOSIS.—Staggers in any form must be regarded as a highly dangerous disease: it is more especially so in that stage or form in which it acquires the epithet “mad.” In fact, almost the only chance the animal has of recovery—considering the disease to arise from congestion or inflammation—is, the timely abstraction of a very large quantity of blood; should which be followed by remission of the coma or phrenzy, and should it not return again, or but in a subdued form, hopes of recovery may be entertained: on the other hand, should the evacuation merely be succeeded by the appearance of weakness or faintness, and but by such remission or cessation of the symptoms as would be expected to ensue from that cause alone, the latter relapsing with the animal’s returning strength or revivification, the worst may be foreboded of the result. Mr. Grattan informs us, “when bleeding does not relieve the coma of the disease, and when the pulse, from being 48 and full, becomes exceeding frequent, the animal gradually sinking the while, it may be inferred that the pressure upon the brain is not from distended blood-vessels, but from purulent secretion or serous effusion, the consequence of a few days of previous irritation.”

TREATMENT.—The necessity for immediate and copious bloodletting having been enjoined in speaking of prognosis, I need only add here, that when blood can be obtained from the temporal artery, that vessel is to be preferred to the jugular vein. In general, it is advisable to open both temporal arteries: should, however, even from both of them, the flow of blood be not free and abundant, the jugular veins must be had recourse to, it being absolutely necessary that blood in sufficient quantity should be extracted to produce symptoms of faintness, and it being highly advisable that this should be done as quickly as possible. Supposing the blood can be collected in a blood-can, or water-pail, for this cannot on all occasions be accomplished, in general we shall find from two to three gallons require to flow before this effect be produced; so much depending upon the size, condition, constitution of the horse, and other circumstances. I used to consider the jugular vein to be quite as good a channel as, if not a better than, the temporal artery for bloodletting in affections of the head; but some striking cases I have had in my own practice have greatly altered my former opinions; and I find I am very much borne out in these altered views by the reports of others. At the same time, I wish it to be understood, that arteriotomy is in no case to be confided in, unless blood can be obtained from one or both temporal arteries, in a full and fast stream: a dribbling or tardy current will avail nothing, and need not be persisted in.

In a communication many years ago from my respected friend, the late Mr. Cordeaux, who served thirty years as a V.S. in the Artillery, he informs me “he has seen eminently good effects from bleeding from the temporal artery, in six or seven instances; that two cases, which were considered hopeless, after several ineffectual bleedings from the jugulars, recovered, he verily believes, from an accident that befel them during the night, by which the pins were torn from their temples, and considerable quantities of blood in consequence had escaped, and were found next morning in their mangers.” I have myself had several cases which were despaired of, until, as a last resource, while the animals were desperately struggling and throwing themselves about, I have contrived to plunge the lancet into their temples, and allowed them to bleed *ad libitum*, regardless of the quantity lost, paying attention, in

fact, only to effects : in several instances, to the surprise of all around, has the frantic patient, from kicking about in a pool of blood, jumped suddenly and unexpectedly upon his legs, and, after shaking himself once or twice, appeared, like magic as it were, almost all at once, restored to his right senses. Mr. Rickwood, V.S., Bedford, has likewise related a case in *The Veterinarian* for 1830, which tells eminently in favour of preferring bloodletting from the temples. Mr. R. was sent for to attend a mare who had just come in with the Leeds mail from Shefford, and was seized with staggers. She was wandering about, with dilated pupils and laborious respiration, and also symptoms of palsy of the hind extremities. She was bled to twelve pounds from the jugular vein, and had administered an aloetic drink and frequent clysters. The symptoms increasing, both temporal arteries were opened, from which she was bleeding rapidly when Mr. R. was compelled to leave her. The bleeding continued until she became so exhausted as to begin to make a noise in breathing, "the same as a roarer would make in his gallop." At length she fell ; after which the symptoms began to subside, and in a few days she was sent home.

The black mare, who was attacked with phrenitis on her return from Norwood—whose case is mentioned in my account of "concussion of the brain"*—had, during my absence, been bled copiously, twice or thrice, from the jugulars, but without any very apparent benefit. When I first saw her, she was lying upon her side, flinging herself about in a state of phrenzy, surrounded by spectators who were betting any odds she could never rise again ; I lost no time in plunging my lancet obliquely into one of her temporal arteries, from which instantly issued such a stream of blood—spouting up like a *jet d'eau*—that I deemed it quite unnecessary to endeavour to turn her to puncture the other temple. She lay, rapidly and profusely bleeding, for some minutes, when, to the astonishment of all her beholders and despairers, she suddenly sprang upon her feet, gave herself a rustling shake or two, and immediately commenced eating some hay which happened to be in her manger. In fine, from that hour she was a recovered mare.

PURGATION for this disease has ever stood in such high repute among farriers, that a common saying among them is—"purge

* Turn back to page 5.

a horse with staggers and you cure him ;” and this, like many other old veterinary adages, appears to have been founded in sound observation : in fact, it is a practice pursued by every surgeon in cephalitic cases, with the twofold view of removing any source of irritation or cause for the head-affection that may exist within the bowels, and of indirectly abstracting blood by derivation and discharge. I know of no surer or more effectual cathartic than aloes, and their operation will be both augmented and prolonged by the addition of calomel. The two ingredients may be exhibited either in ball or drench : the latter, supposing it can be administered, being perhaps the preferable mode of exhibition, on account of the shorter space of time in which it is likely to traverse the alimentary canal.

The Drench.
Take of
Decoction of Aloes* . . . Oj
Calomel ʒiiss
Stir the calomel into the decoction
made warm over the fire.

The Ball.
Take of
Purging Mass ʒiiss
Calomel ʒiiss
Mix, and form a ball.

Or about a drachm of the powder of croton seeds may be made into a ball, and given in lieu of either of the above prescriptions.

Whatever be the medicine or formula administered, it is good practice to follow the first dose up, after an interval of twelve or eighteen hours, with diminished doses of the same at inter-spaces of six or twelve hours, according to circumstances ; there being little cause for apprehension, in such cases as these, of superpurgation.

Enemata, containing aloes, should also be injected, as early as the operation can be performed, after bloodletting and giving the medicine ; and again repeated about the time that the cathartic may be expected to take effect. Should the first exhausting bloodletting be attended with some relaxation or remission of the symptoms, no time need be lost in closely trimming the hair off the forehead, occiput, and temples, and applying to those parts the strongest preparation of blistering ointment.

In cases in which the legs are deadly cold, and the animal is in that lethargic state that no impression can be made upon them

* For the formula for the decoction, see vol. i, page 113.

by friction or bandages, however warm in their nature, the best application is a mustard embrocation, which, to give it additional efficacy, may be made up with oil of turpentine.

Should the first large abstraction of blood not be followed by any or that relief which we could desire, as soon as the pulse informs us that the system is sufficiently recovered from its effects, we must practise another arteriotomy or venesection, to as great an amount as the animal's reduced powers will bear; after which, probably, it will be advisable that we should await the operation of the purge and blisters, providing the latter appear disposed to act; if not, they must be repeated, or turpentine mustard plasters may be substituted. Further than this it would be futile to pretend to give directions for treatment: so much depends upon the circumstances of the individual case, and so much must, consequently, rest with the judgment of the practitioner in attendance, that, beyond such general rules as are here laid down for his guidance, it is in no one's power to direct his proceedings.

APOPLEXY.

This is a subject on which I am afraid I shall be at issue with some of our most respected veterinary authorities. I cannot consent to regard as apoplexy any form of the comatose or somnolent disorder, familiarly known by the name of *sleepy staggers*, although I have described that affection as occasionally *terminating* in apoplexy. I regard apoplexy in the horse—in accordance with the accepted definitions given of it in man—to be a general loss, and commonly a sudden one, of consciousness, and feeling, and voluntary motion: respiration and circulation still continuing, but in a more or less disturbed condition. It must be regarded as the most dangerous form of cerebral disease. The horse attacked with it is from the first prostrated. Should there have pre-existed any warning symptoms, they have been unmanifested or have probably escaped notice. We are called to the animal lying in a state of insensibility and without the power of voluntarily moving, though his limbs are relaxed, and perhaps agitated, as well as his body, by tremor. His respiration is laboured, and sighing or stertorous, and sometimes most loudly and distressfully so. His pulse is slow, but full and strong. He is all over in a cold sweat, and his extremities are deadly cold. He perhaps froths at the

mouth. His nostrils are dilated, showing a highly reddened state of the lining membrane; and the conjunctive membranes are in the same excited condition. The eyes present a ghastly stare, arising from the dilated state of the pupils, which are unaffected by light, however strong. In fine, neither noise, nor blows, nor anything we can do to him, makes any impression upon him. We cannot rouse him out of his lethargy. His fate appears to be irrevocably sealed.

D'Arboval, although he has enumerated symptoms which, according to the view I have taken of apoplexy, are, strictly speaking, inadmissible, as being in themselves apoplectic, still, in the end, comes to the conclusion, that apoplexy is *not* to be considered “*comme prononcée qu’au moment ou l’animal tombe tout à coup, sans mouvement autre que celui des flancs :*” transient vertigo, heaviness and dependance of head; staggering gait; diminution of sight, hearing, and appetite; frequent gaping; stupidity, and numbness or torpor of limb; drowsiness, or else apparent laziness or weakness, &c., being but the “*avant-coureurs*” or symptoms *premonitory* of the fit: in fact, symptoms which belong to coma or sleepy staggers, and which, though they may end in apoplexy, are more likely to bring forth a paroxysm of phrenitis.

THE DIAGNOSIS between apoplexy and coma or sleeping staggers, now becomes apparent. In coma, the horse is *standing*, and any loud noise, or smart shake or blow, will rouse him; and often so completely will he recover his senses when roused, that he will not only recognise persons and things around him, but take food in his mouth and chew it: in the apoplectic fit, nothing will produce such an effect, though, should the animal by any means happen to be relieved—a case most rare—apoplexy may become mitigated or converted into coma. Staggers, either in its sleepy or mad form, may commence with symptoms resembling those of megrims, a circumstance which has given rise to the notion that megrims occasionally terminates in staggers; but this I do not apprehend to be the case; these are only symptoms so like megrims as, while they continue, to be perhaps indistinguishable from that disorder, *and not genuine megrims*; that being a disease *sui generis*, and one that lasts for years, returning from time to time, without ending in staggers, much less in apoplexy.

THE AUTOPSY of horses that have died of apoplexy has commonly shown a surcharged condition of the vessels of the cerebrum and its membranes with blood—a heavy congested state of them, which on some occasions has ended in rupture and extravasation; though more commonly it has produced serous effusion into the cavities of the brain. In reference, however, to this state of effusion, we find it observed by Dr. Copland, that “the inference clearly deducible from faithfully observed facts, is, that the effusion is not the cause but the consequence of the apoplexy; and that a considerable portion of the effusion takes place immediately before or soon after death.” It was the discovery of blood in one case, and of serum in another, that gave rise to a division of the forms of disease by the older physicians into *sanguineous* and *serous* apoplexy; though, from the foregoing observations, there would appear to be no practical ground for the support of such presumed distinction; and it is said, cases have occurred in which nothing extraordinary has been discoverable either in the brain or its membranes. Mostly, the disease will be found to have its origin in pressure upon the brain, or else in some disturbed or interrupted state of the circulation of blood through it; and should we by any means succeed in taking off or relieving this pressure while the powers of re-action still survive, there may be a chance of the patient’s recovery.

The following very interesting case of

APOPLEXY CAUSED BY A TUMOUR UPON THE FOREHEAD, was inserted in *The Veterinarian* for 1840, by Mr. Relph, veterinary surgeon, Sebergham, near Carlisle.

“A mare had a firm circumscribed tumour upon the right parietal bone, which, though originally no larger than a nutmeg, had within the last five months acquired the bulk of an orange. She always evinced much dread of having it touched. While working one day in a thrashing machine, she was seized with an apoplectic fit, and, while she lay insensible, the tumour was observed to have become flattened, irregular, and diffused, and to have extended to the right orbit. She was bled twice during the fit; and then an incision was made into the tumour, and about an ounce and a half of coagulated blood let out: after which, became apparent a perforation through the parietes of the skull. She died an hour afterwards without a struggle. Examination of the tumour discovered a small opening through which a probe passed into the cranium by the side of the longitudinal sinus; and upon both

sides of this there existed effusion of blood. The structure of the brain itself was natural.

THE PROGNOSIS of a case of apoplexy holds out little hope of the life of the patient. Should the practitioner be called in early enough, and be, from the promptitude and propriety of his measures, fortunate enough, to restore the lost senses and get the patient on his legs again, he may indeed entertain the most sanguine expectations of recovery; horses not being the subjects of those hemiplegic affections which are so apt to follow apoplectic attacks in man; and as for any mental derangement or imbecility, we have, for obvious reasons, no cause for alarm on that score. If the breathing continue or become stertorous, the pupil of the eye remain incontractile to light, and there supervene cold sweats and dilated sphincters, we may consider the scene of life to be all but closed. In fine, to use the language of Dr. Marshall Hall,* “in an ordinary fit of apoplexy the prognosis is favorable or unfavorable, according as the symptoms are limited to affections of the *cerebral* system, or are extended to the *true spinal* and *ganglionic*.”

TREATMENT.—Presuming the fit of apoplexy in which we find the horse, to be, as it commonly is, the result of the presence of too much blood in the encephalon, it is our duty, without a moment's loss of time, to set about to diminish this. And here, the jugular veins, for two reasons, are not near so eligible for bloodletting as the temporal arteries: first, it is awkward and difficult to open and compress them in the recumbent posture; and, secondly, we shall probably obtain freer and more speedy evacuation from the arteries. I may repeat here what I said under encephalitis, that both my own practice and that of several others in whose observation I confide, decide very much in favour of arteriotomy in the temples in preference to drawing blood from the jugulars. In regard to the quantity of blood to be drawn, as it hardly ever happens that we can collect it, we must in this, as in all similar cases, be entirely guided by the effects of the loss of blood upon the pulse and by the general state of the patient. Should bloodletting to the fullest extent we durst practise it fail to rouse our patient, stimulants of various kinds may be made trial of—such as the application

* ‘On the Diseases and Derangements of the Nervous System.’

of ammonia to the nostrils, or even the injection of it into those cavities: almost any experiment of the kind being warrantable under such circumstances. The tobacco enema might be tested, supposing there seemed any reasonable probability of its conferring benefit; or a mustard embrocation, made up with oil of turpentine, may be spread upon the forehead and temples shorn of their hair. Providing we can by any measures dispel his lethargy—which, alas! there is but too much reason, from past experience, to be apprehensive we shall not succeed in accomplishing—the same remedies as are recommended for coma and phrenitis may, with some variation in accordance with the change of circumstances, be employed afterwards.

TRACHEOTOMY.—On no animal is this operation practised with more facility than on the horse, neither are the consequences of it such—though it may, now and then, leave the animal a roarer—as to deter us from practising it in any case in which important benefit is likely to accrue from it. Dr. Physick, of Philadelphia, first suggested its performance in hydrophobia; and Dr. Marshall Hall has recently advised a trial of it in cases of apoplexy: his words are, “in *apoplexy from congestion*, I am persuaded that the fatal end might be averted by the timely adoption of this measure. The patient dies of asphyxia, and of an asphyxia which tracheotomy would, I believe, prevent; or of coma, which bloodletting would cure.”

VERTIGO—MEGRIMS.

Indefinite and vague as the meaning of the common appellation “megrims” is, it must, in accordance with custom, be admitted into our nosology, and, being admitted, it will become the duty of the scientific veterinarian to inquire to what especial disease he is to attach it. Writers on farriery have regarded it as a sort of epilepsy. But farther than the mere circumstances of both disorders being sudden in their attacks and consisting in fits, there appears no foundation for such analogy: on the contrary, when once the fits of the two diseases have been actually witnessed, I should say any attempt to institute a medical resemblance between them will by the practical man be instantly abandoned.

With those out of the profession who have much to do with horses, megrims appears a disorder intelligible enough : every horse-dealer or groom knows, as he thinks, well enough what megrims is ;—in his mind there is no mistaking it for anything else. And, in point of fact, so far as a certain common assemblage of symptoms go, as a recognisable malady, megrims needs no interpretation ; it being neither more nor less than what, in a medical sense, we should designate *vertigo*. Even then, however, we are not apprised of the nature of the morbid condition of the encephalon on which we presume it depends.

By *vertigo*—as synonymous with *megrims*—I do not mean any simple or single symptom of giddiness which a staggered horse may evince ; but I mean an assemblage of vertiginous symptoms which suddenly attack, and as suddenly disappear, after the manner of a fit ; and to which horses all their lives may be at times subject, and yet never experience what we understand by *staggers*, i. e., encephalitis or phrenitis, or even coma. This makes me say, megrims is a disease *sui generis* ; though of what precise or definite nature I am not at present prepared to give an opinion.

The SYMPTOMS are, a most unnatural and constrained elevation of the head, and erection and stiffening of the neck, with such awkward and obstinate protrusion of the nose, that all attempts to rein in prove fruitless ; for this reason, and on account of the upward, wild, vacant stare the countenance has, the horse, in slang language, is often called a “ star-gazer.” In some instances, however, the carriage of the head, instead of being upward, is stiffly to one side. Carry it, however, which way he may, the object of the animal appears to be, to fix his head and render it as little as possible affected by the movement of the body. Such a horse is readily recognised as a “ megrimed ” subject—one that is apt to be suddenly seized, every now and then, while at work, with stopping, and violent shaking of the head, rearing and reeling round or backward, and perhaps falling, to the imminent peril of himself as well as of his rider or driver : in a minute or two all is over, the animal has recovered his senses, and is able to resume his work ; though there is mostly some manifestation of strangeness and debility about the animal, which renders it,

when it can be done, advisable—in some cases it becomes compulsory—to return him to the stable. It is not every horse that has the peculiar carriage of the head before described that is subject to fits of megrims; while, on the other hand, there are horses who experience such fits without any such predisposing manifestation. Generally speaking, these fits relapse at uncertain intervals—becoming in a manner constitutional—though it is possible a horse may have one fit, and suffer no return.

CAUSES.—High or full condition, hot weather, exertion or agitation of any kind, may be said to be likely to produce a fit in a horse predisposed to megrims; although such causes are not in some cases recognisable. Harness-horses in particular appear subject to the disorder: this may arise from the long-continued constraint the bearing-rein puts the head to. I knew a horse who had a fit of megrims every time he was put into harness; as if temper seemed to induce it. D'Arboval mentions an instance of a young vigorous stallion becoming seized with megrims brought on by repeated acts of covering.

The PATHOLOGY OF MEGRIMS remains undeveloped. It cannot be said essentially to consist in any determination of blood to the brain, though that may sometimes prove the immediate excitant; else, why should it so often return, and occasionally under circumstances when no such determination can be proved to exist? Mr. Charles Percivall informs me that he has discovered water in the brains of megrimed horses. Nothing will satisfactorily account for the general incurability of the disease but organic change of some part of the sensorium. I do not believe, with the French veterinarians, that megrims ever arises from a disordered alimentary canal.

HEREDITARINESS.—With some horses megrims appears to be an hereditary affection: there has existed from their earliest colthood a look and a manner that the eye of the horseman detects as symptomatic of ingenerate aberration, which at mature growth, and when put to work, is likely to turn to megrims; or which may not turn to anything more than a sort of stupidity or idiocy, or unusual stubbornness when required to do anything. A colt, only three years old, belonging to the First Life Guards, on being taken up out of

the strawyard, in his fourth year, to be broken, manifested this megrimmed disposition to such an extent that the riding-master pronounced him incapable of being rendered fit for the ranks: he was in consequence sold, it being, from all we could learn, an hereditary aberration.

The TREATMENT of megrims, in such a case as has just been related, where there is every reason to believe that the affection is dependent upon some peculiar aboriginal formation or state of the encephalon, cannot possibly prove of any avail; nor will much benefit—at least not permanent relief—be obtained from it in such cases as date their beginning from a long time back, and have ever since, at various intervals, experienced relapses of it. We may procure longer remissions—we may by watching, and diet, and so forth, occasionally succeed in warding off threatened attacks; but we shall rarely, very rarely, radically and permanently cure such disease. Those cases hold out the best prospects for cure in which the subjects are young, and the attacks prove the first and only ones they have experienced, and are manifestly traceable to condition or living, or work, &c., proving often but a kind of prelude to phrenitis or staggers;—but these, in point of reality, cannot be considered as genuine megrims. The treatment is to consist in bloodletting and briskly purging, and in—should that also be deemed necessary—blistering the head. Here, likewise, setons through the temples, or along the nape of the neck, are likely to prove of especial service, should they be kept in a sufficiently long time.

The LIABILITY TO RETURN of megrims is so notorious, that a horse known once to have had a fit is looked upon with extreme suspicion, and, as a consequence, experiences considerable depreciation in the market. The same causes and circumstances by which one attack has been produced will always be likely to engender a second; and though we may by attention to diet and work, and by occasionally bleeding and physicking, ward off the paroxysm for a longer or shorter time, still, sultry weather or strong exertion may bring it on in spite of us, and at a time we little expect it. This uncertainty, coupled with the dread of its approach and consequences, commonly proves the occasion of the unfortunate subject being sold for what he will fetch;

continuing to change hands, probably, until some one purchases him at a low rate, by way of speculation, as a subject for further or experimental treatment.

TYING THE CAROTID ARTERIES was an operation resorted to in affections of the head of this nature by my deceased friend, Mr. John Field. He mentions one case in which the horse had long endured megrims, and bloodletting and blistering had been fully practised, wherein he put a ligature around the carotid of the near side. After the operation, the horse appeared very stupid for some days, but at length became lively, fed well, and, by the time the wound in the neck had healed, seemed quite recovered. He was sent to farming work, where he continued well up to the expiration of twelve months from the time of the operation. He then evinced symptoms of return of his disease, viz. stupidity, occasional delirium, loss of sight from dilated pupils, &c. He had given him eleven drachms of aloes, and had taken from him xxviii lb. of blood. Three days afterwards, the physic not operating enough, four drachms more of aloes were given: he was kept quite quiet. Three weeks from this, some symptoms still remaining—such as stupidity, partial palsy of the optic nerves, &c., Mr. Field took up the carotid artery of the opposite side. In a week afterwards he had once more quite recovered his senses, had become lively and obedient, and ate with a good appetite. Of the sequel of this interesting case I regret I am uninformed.

The experiment of tying both carotids was made by Mr. Field upon a black mare, who evinced some peculiar head-affection—"biting at everything she saw." She was cast, and had her carotids tied: first, that on the near side; then, the one on the off. On drawing the ligature close upon the latter, the breathing became stertorous, and she died in two minutes afterwards. On examination of her neck, the arteries were found securely tied; nor was either the sympathetic nerve or that of the par vagum included within either ligature. There was a good deal of fluid within the ventricles; but no inflammation of the brain nor of the frontal sinuses.

The RESULT of the first of these experiments is quite in accordance with what we should expect, from knowing what happens when any of the arterial trunks of the body are inter-

rupted by ligature : what is called *anastomosis*, or inosculation, takes place between the branches of the trunk proceeding from either side of the ligature, by which inter-union, in the course of some months, the circulation of the blood becomes perfectly re-established. When the carotid artery was tied, it appeared to require twelve months before the blood found courses to run to the brain with its wonted freedom ; as soon as it had, the malady returned : so that, in fact, all that was gained from the operation was a year's remission of the disorder ; and this is all, I am afraid, we are likely to derive by it. I have myself tied the posterior aorta in the dog successfully. For many months afterwards the animal followed me about as usual ; and when I had him destroyed for the purpose of preparation, I found ample circuitous vessels had been formed to carry on the circulation with the same facility and freedom as before the operation.

PARALYSIS—PALSY.

DEFINITION.—A loss or diminution of the sensibility or mobility of some part of the body ; commonly of both faculties.

KINDS.—Dr. Cullen describes four :—1. *Paralysis partialis*, palsy of some particular part or single muscle ; 2. *Paralysis hemiplegica*, palsy of one side of the body, longitudinally ; 3. *Paralysis paraplegica*, palsy of one half of the body, or thereabouts, transversely, as of the hind quarters ; 4. *Paralysis venenata*, palsy from the effects of poison. To these some veterinarians have added a fifth kind, one they have denominated *general palsy* ; but their cases in illustration have not borne them out in this addendum : in fact a *general palsy*, properly speaking, amounts to an apoplexy. D'Arboval describes palsy as *ambulatory*, affecting first the posterior extremities, afterwards the anterior, and finally returning to its original seat. There may occur such cases : I never saw any.

THE KIND TO WHICH THE HORSE IS MOST DISPOSED IS *paralysis paraplegica*. Hemiplegia but rarely occurs.

THE SYMPTOMS OF PARAPLEGIA are very characteristic of what ails the animal. The horse is down—unable to stand ; nor can he raise himself upon his legs, although he struggles

to do so violently with his fore limbs, and succeeds perhaps in erecting himself into the position of a dog sitting: still his hind quarters remain powerless upon the ground, reclined sideways, from his not even being able to support them in the proper posture. The probability is they have lost the faculty of feeling as well as that of moving: this may readily be tested by pricks and pinches of the skin, by blows, &c. Sensibility is not uniformly lost with mobility: rarely, indeed, is it lost while motion is retained. In extreme cases the rectum and bladder participate in the paralysis: the urine and fæces are retained. Oftener, these evacuations will pass involuntarily, owing to palsy of the sphincters; and when this occurs, we may in general relinquish every hope of recovery. In all cases it will be right for the practitioner to ascertain the condition of the bladder and rectum *per anum*.

The SYMPTOMS OF HEMIPLEGIA consist in manifestations of a loss of voluntary power of one side of the body, and of the correspondent fore and hind limbs. Should the deprivation of power be complete, the horse will be found down, lying upon the paralytic side: it is only while the hemiplegia is partial or incomplete that he can stand, perhaps walk, dragging, as he moves along, the affected limbs after him: his head and neck, together with his loins and hind quarters, will be carried inclined to one side; the affected ear will be drawn into its socket; the corresponding ear hang lopping down; the lips be pendulous and drawn to one side.

M. Girard, fils, has left us a case of hemiplegia replete with so many curious observations, that I shall here translate it:—

The sensibility of the left—the affected side—proved extremely acute; the lips and alæ of the nose were drawn to the right side, the contrary to that to which the head and neck turned; the occlusion of the nostrils was such that the air made a blowing noise in its passage through them; the left ear was palsied, and the tongue slightly distorted; the lips and nostrils retained their sensibility, though in a diminished degree to what it was on the unaffected side. When oats were laid before the horse, he seized them with the right side of his month, the left remaining motionless: he experienced great difficulty in mastication, and succeeded only in swallowing a part of his food, the remainder, staying behind, lodged between the cheek and molar teeth. He could not manage to pick up his oats from a plane-surface, and when pre-

sented to him in a trough, he plunged his muzzle into the middle of them, opening wide his mouth. He could drink but slowly and with difficulty, and only by thrusting his mouth deeply into the water. The nostril of the affected side perceived scents. He could walk, but could hardly sustain himself after but a short exercise: if attempted to be turned to the left side, this instability became still more manifest; pressure upon the vertebral column from the head to the tail seemed to give great pain. The respiration, although sonorous, was regular. On the fourth day, the animal, unable any longer to stand, sank down, and after several turns and ineffectual struggles to rise, rolled over and lay upon his right side. His bowels were relieved by manual operation; his bladder with the catheter; though after this even he passed his dung; but could not posture himself properly to void his urine. His pulse, like his respiration, remained undisturbed. He died on the seventh day.

AN EPIDEMIC FORM is in some situations, or under peculiar circumstances, assumed by paraplegia. Low, wet, cold, marshy pastures; or those in which there are stagnant waters, or wherein currents of cold air prevail, and which are poor or insufficient to keep cattle in any sort of condition, are very apt to be productive of cases of palsy, particularly in the autumnal or spring season of the year; the remedy for which consists in removal of the horses or cattle to other—upland—pasture, where the soil is drier and the feed better.

A SINGULAR CASE OF INCOMPLETE PARAPLEGIA, and something resembling epileptic fits, occurred to Mr. Read, veterinary surgeon, Crediton, Devon, by whom it was inserted in *The Veterinarian* for 1839.

The horse was nine years old; had had an abscess upon the poll for several months; and in the end was seized with partial incapability of moving his hind-limbs. He staggered in his walk, and soon afterwards his fore-extremities became implicated; any act of moving produced convulsive twitchings and spasmodic rigidity of the muscles of the neck, shoulders, lips, &c., with the retraction of the eyes and protrusion of the haw. The general excitement was very great. Any sudden noise would bring on convulsions of an epileptic character, viz. violent spasmodic muscular action, until he fell on his side, and then all four legs would be as stiff as posts. Sometimes one, at other times all the legs experienced rapid convulsive movements; and at the time there would be foaming at the mouth and grinding of the teeth, eyes retracted, and eyelids partly closed. The fit would last about ten minutes, and then the horse would scramble up and begin to eat. The paralysis and fits continued from the 23d to the 27th May, when he died in a convulsive paroxysm. The treatment consisted in bloodletting and purging; in giving

half a drachm of prussic acid in a pint of cold water every four hours. It afforded no relief. "On taking off the skin covering the occiput, a sanious discharge escaped, exposing a piece of detached bone, the cavity around being in a state of necrosis. A small sinus extended into the investment of the skull, with serous effusion and a little pus upon the cerebellum and spinal marrow. The tunics were slightly congested." The whole of the occipital ridge was in a complete state of caries. There was no interposition of sound bone between the diseased part and the cranial cavity. Mr. Youatt—to whom the bone was sent—presented it to the Veterinary College.

PARALYSIS PARTIALIS occurs generally in parts about the head. The face is drawn to one side; the corner of the mouth upward, towards the eye; and the distortion is evidently occasioned by a loss of power in the antagonist muscles. The masseter muscle has been palsied, and the consequence has been difficulty in mastication, causing the horse to cud his food and eject it, instead of swallowing it. Amaurosis is an instance of partial palsy: light cannot be perceived, and yet the eye retains the power of motion.

A SINGULAR CASE of paralysis, partially involving both the voluntary and excito-motory or involuntary systems, is related in *The Veterinarian* for 1833, by Mr. Bainbridge, V.S., Saffron Walden.

A three-year-old colt presented the following symptoms:—Penis drawn, and urine dripping away; tail depressed, without power to raise it; fæces lodged in the rectum for want of the power to expel them; countenance dull; lips slightly drawn to the left side; sight impaired, most in the left eye; mouth hot; pulse 60, and full; willing to feed, but has difficulty in taking food into his mouth; runs his head, mouth open, into the manger, and throws the food from side to side before he is able to get it between his grinders; that accomplished, he appeared to masticate well. Mr. B. was assured the colt had received no injury about the head or otherwise. He had previously been noticed for being dull at pasture, not playing about like other colts, and for not having thriven. He was bled, and took a cathartic, and was put into a loose box. While the physic was operating, there being no voluntary power to void the fæces, they ran from him spontaneously down his tail and legs, as he moved about. He staggered more in his gait than yesterday. Apply a strong blister to the head. Sixth day, much worse: now, after he had seized hold of food, it fell from his lips again, and he had lost all power of mastication. On the tenth day he was destroyed.

Post-mortem.—A small quantity of fluid and some lymph were found in the

left ventricle of the brain. The plexus choroides were rather larger than ordinary, and contained a tumour the size of half a small bean; the brain unusually soft and pulpy about the origins of the olfactory nerves.

Mr. Daws, V.S., London, gives a case in *The Veterinarian* for 1839, in some respects similar to this. A horse received into his infirmary had that reeling gait of the hind quarters peculiar to broken-backed horses, though able to kick; the tail dependent, swinging like a pendulum, without power to raise it; the sphincter ani partially relaxed, exposing the fæces in the rectum; occasional straining to void dung and urine, but with little or no effect, a little urine only dribbling away afterwards, or a little fæces, which seemed to pass involuntarily. The hand passed *per anum* was not grasped by the rectum; in fact, it rather resembled a sack than living intestines; the sphincter ani remained relaxed, and the air rushed in and out at every inspiration and expiration. The bladder was enormously distended: its fundus reached the umbilicus.

Treatment.—Introduction of the catheter and evacuation of the bladder, assisted by manual pressure from within the rectum. The bladder did not contract after having been evacuated, but collapsed, and remained flaccid; it, however, gradually recovered some degree of tone in the course of ten days or a fortnight. The rectum also became contracted in caliber, but the sphincter remained *in statu quo*. His diet is strictly confined to laxative nutritious food; and he appears to suffer no inconvenience unless his bowels become constipated.

CAUSES.—Palsy is mostly the offspring of injury. In too many instances paraplegia has appeared after casting. The horse is cast for the performance of some operation: all seems to be going on well up to the time of liberating him from his fetters; which done, to the surprise and dismay of the operator, the patient is found unable to rise. It is at once known what is the matter. "The horse's back is broken;" that is to say, the spine is injured—fractured, most likely,—and the compression upon the marrow is causing the paraplegia. The same accident has occurred from violent leaping or falling; it is possible for it to happen even from the horse being self-cast in his stall.

Mr. Hudson, V.S., Lincoln, has inserted a case in *The Veterinarian* for 1829, of an aged mare, who—

Hunting with Sir Richard Sutton's hounds, in leaping a ditch two yards wide, "dropped in with her hind parts, but succeeded in getting out, and staggered a short distance farther, when she fell, and could not be made to get up again." Mr. H. was sent for, and found the hind limbs completely

paralytic, both sensation and motion being destroyed in them: the fore legs retaining their full action and sensibility. The mare survived the accident but a few hours. The anterior lumbar vertebra was fractured; the spinous process was torn from its body, and was pressing upon the theca vertebralis, at which part was a considerable quantity of extravasated blood, and also some among the enveloping muscles. The lumbar transverse processes, which had previously become ossified together, were also fractured through their middles. The circumstance of the mare being enabled to get out of the ditch was owing, Mr. H. thought, to the fractured vertebra remaining in its place "until the time of the fall, although previously broken."*

LABORIOUS DRAUGHT, M. Bouley, in the *Recueil de Médecine Vétérinaire* for June, 1830, has remarked, is not an uncommon cause of paraplegia; such efforts, when violent, being likely to concuss or strain the medulla spinalis in its least supported part, the loins; and to produce, either immediately or remotely, effusion into the theca vertebralis, satisfactorily accounting for the palsy.

COLD COMBINED WITH MOISTURE is known to produce palsy. In marshy pastures, in cold and wet seasons, the disorder has seized the turned-out horses. In India, what is called

KUMREE is now, I believe, ascertained to be paraplegia, proceeding from the effects of cold and wet.

PALSY IN MAN is a common consequence of what is called "an apoplectic stroke." To this species, as far as my observations have extended, horses can hardly be said to be subject; indeed, apoplexy in horses is very rare; and when it does occur, mostly destroys life.

REFLECTED IRRITATION, caused by disease or derangement of organs unconnected with or remote from, the seat of palsy, must be ranked among its causes. That it is operative in the horse's constitution I cannot for a moment hold a doubt; but to what extent I am not yet in a situation to say. The irritation, whatever or wherever it may be, is first carried to the nervous centre, whence, by a reflex operation, it is transmitted to and along the nerves of voluntary motion, producing similar effects upon them and the parts to which they are distributed, as though the nervous centre itself had actually been the subject of lesion or compression. To cases standing on record—

* The same case is related in vol. i, page 262.

though they include causes which, from their nature, lead one to doubt—I feel bound to pay due attention; and therefore I submit the following accounts, taken from D'Arboval's Dictionary, without, on my part, any kind of annotation :

M. Damoiseau knew a three-year-old horse to be suddenly attacked with *general* paralysis, after having been copiously bled by a farrier for indigestion, M. Laurezal witnessed an attack of paralysis in a mule, on the suppression of a fistula which had been discharging for eighteen months.—M. Olivier participated in an observation made at the Veterinary School at Lyons, of paraplegia appearing the morning after firing for ringbone.—Lean horses rapidly made fat by sainfoin and lucerne, and other nutritive diet, have been known to experience paralysis, of which D'Arboval says he had a case in a mare of his own.—Furthermore, we are informed by D'Arboval that, in the course of his own practice, he occasionally meets with paralysis in horses, arising from indigestion and nephritis: Vatel and Olivier, he says, have published cases of the former; and in respect to the latter, he tells us that it not only occurs in horses, but likewise in oxen and sheep.

PATHOLOGY.—Sir Charles Bell has proved beyond question, by experiment confirmed by observation, that of the two sets of roots by which the spinal nerves take their origin, the anterior are conductors of sensation, the posterior of the power of motion; and there is good reason for believing that the correspondent columns of the spinal marrow are similarly endowed and equally distinct in their economy; supposing, therefore, that one set of columns or roots are affected, the other remaining in their normal condition, the effect is, that mobility is lost, while sensibility is retained, or *vice versa*. In beautiful illustration of this, the case following is given by Sir Charles. In a patient under his care a tumour existed “of the form of an almond but larger, and into it the *motor* nerves both of the right and left sides were gathered, while the sensitive roots remained free.” The result was—in practice as was by theory foretold—that the lower extremities were deprived of motion, whilst their sensibility remained undisturbed. The case of a horse, related by M. Bouley in the *Recueil de Médecine Vétérinaire*, serves, so far as effects go, to confirm the above. A stallion, five years old, was seized with paraplegia. He sweated from pain, and his pulse grew full and strong, and yet he continued feeding. During the insertion of a couple of setons in the thighs he mani-

fested great pain, plunging violently under the operation with his fore parts, at the time that his hind were without the power of moving. In the majority of cases of paraplegia, the spinal marrow is so injured or compressed that both its functions—mobility and sensibility—are simultaneously destroyed or impaired; there may and do, however, occur cases in which, from partial injury or compression, but one of these faculties is lost. The lesions sustainable by the medulla or its membranes, from fracture and consequent displacement of the vertebræ are resolvable into such as produce compression only, and those that occasion laceration; from the latter hemorrhage may ensue, to say nothing about the harm that mere concussion or extension of the marrow may occasion. What is called “a broken back,” in general arises from fracture of some one or two of the posterior dorsal or anterior lumbar vertebræ, mostly, I believe, of the 15th, 16th, or 17th dorsal.*

Of the cases called *general paralysis*, originating in falls or blows, the majority may be regarded as so many instances of “broken neck.” The force applied—to the occiput, commonly—fractures the base of the skull, breaks most likely the condyloid processes, the dislocation consequent on which occasions compression of the anteriormost portion of the spinal marrow, paralyzing the voluntary muscles of the body generally, and destroying their sensibility, probably, as well. At the same time, the respiration being affected, will show that the medulla oblongata is implicated in the injury.

There can be no doubt but that, on occasions, such spontaneous morbid changes of the medulla spinalis and its membranes take place as give rise to paralysis; the cases called idiopathic paraplegia, rare though they be, are sufficient to prove this. It does not seem likely that simple congestion would be followed by such consequences; but congestion may end in extravasation or effusion, either of which terminations might give rise to palsy. Not congestion, however, merely, but inflammation must, every now and then, from a variety of causes, arise in the medulla spinalis, or rather in its membranes, particularly in the region of the loins, where these parts are more liable to become strained, or stretched, or lacerated.

* For further information on “Fracture of the Spine” consult vol. i, p. 261.

As in the case of encephalitis, the arachnoid appears to be the especial seat of the inflammation.

M. Bouley found the membrane in an intensely injected state, to the extent of fifteen inches, in a horse who died of paralysis, with some effusion underneath it. In respect, however, to the quantity of fluid we may find under the arachnoid, we must bear in mind the recorded fact, one already quoted, that such effusions may and do take place after death; so that unless the examination be immediate, such a circumstance would be regarded suspiciously. The pia mater may be found in a state of inflammation, a case in which the medulla will participate in the diseased action, and in consequence undergo more or less change. Finally, the medulla itself may prove to be in an inflammatory condition. Dupuy mentions a remarkable case of a stallion, affected with complete loss of voluntary motion, whose spinal marrow had become so softened (from inflammation?), that it ran about like so much purulent matter.

Touching the *modus operandi* of *humid cold* as a producer of paralysis, its effects may be local, or, we can imagine, it may operate in a reflex manner through the agency of the general nervous system. In man, spinal meningitis most rarely occurs without the brain being similarly affected. In respect to the cases of paralysis which now and then occur in the stable, among young horses especially, I hardly know to what to ascribe their production. As in the brain so in the spinal marrow, inflammation may occasion effusion of serum, lymph, or purulent matter, or may produce softening of the medullary substance; and any of these effects may prove the proximate cause of paralytic disorder.

DIAGNOSIS.—M. Bouley's interesting researches into the "Lesions of the Spinal marrow," have put us in possession of some valuable marks of distinction between such cases as arise from the affection of the medulla or its membranes—*idiopathic paraplegia*—and those having their origin in indigestion and other remote causes; without however in cases of disease pretending to say from the symptoms, what the precise nature of the lesion may be. In the first case, the paraplegia is awfully sudden in its attack, no warning or sign of its approach being observable; and comes on during or immediately after work—draught in particular. The horse evinces on a sudden extreme

lameness in one hind leg, for which no cause is apparent, and so great is the pain that he cannot, two minutes together, keep the limb in the same position. Soon after, the corresponding limb is attacked; and now the suffering of the animal reaches its highest pitch: he crouches behind, throws his weight forwards, becomes more and more instable upon his legs, until at length his hind quarters sink down, and he falls altogether. When down, he ineffectually struggles to rise again with his fore limbs, they only retaining much power of motion. M. Bouley considers the case of spinal lesion or disease distinguishable from one originating in reflected irritation, digestive or urinary, by the circumstance of the digestive organs being in proper order, and by the animal, in spite of suffering, maintaining a good appetite, for the first day or two at least. The pulse is variable in its character. The respiration is disturbed in ratio to the pain existing. There is neither constipation nor retention of urine, although both evacuations are made with pain; and the fæces are lymphy, and the urine sedimentous. There are always partial or general sweats. The sensorial functions remain perfect. The movements of the hind limbs, diminished from the first, soon become powerless, if not lost. Their sensibility in the beginning of the attack remains unaltered; it is only after the disorder has made progress that the diminution and final destruction of it happens: though cases do occur in which the sensibility continues undiminished, motion only being lost. Taking all cases, however, these two faculties are simultaneously destroyed. And the organic lesions discovered after death, in general satisfactorily account for these varied morbid phenomena. Unless promptly and energetically encountered by remedies, the disorder makes rapid progress, putting the animal, in a few hours even, in a hopeless condition; a termination but too frequent indeed when the case is early and properly treated. Generally, the second or third day is fatal; though some horses sink earlier, others on the sixth or eighth day: rarely later. The disorder may become chronic; though of that little is known, the horse on account of expense and hopelessness being destroyed. In the worst cases, after a time, the palsy appears to spread forwards and affect the respiratory muscles; at this period also the appetite fails, the suffering increases, the pulse

becomes weak and accelerated, sweats break out, strength declines, and death at length closes the scene.

THE PROGNOSIS, generally speaking, must be unfavorable. No hopes can be entertained of a case arising from casting or fall, or other violent injury; and therefore the advice may, without hesitation, be a pistol-shot: at least, it can only add to the cost of the owner and the misery of the unfortunate patient to protract this act of humanity beyond such time as may be found reasonable and sufficient for the trial of any remedial measures that may suggest themselves at the moment. In an idiopathic case, or in one which we may suspect to have its origin in some disease or derangement of some other organ or part, it will be our duty to endeavour to discover and remove the cause; should that be impossible, we must direct our remedies towards its mitigation: the prognosis in any case being more or less auspicious according as it appears in our power to carry one of these objects into effect, and according as the paralysis is more or less extensive and complete. While sensation and the temperature of the affected parts remain undiminished, there is more hope entertainable; on the other hand, when all sensibility, as well as power of moving, is lost, and the palsied parts have a deadly coldness pervading them, the sooner the poor patient is put out of his misery probably the better. The epidemic form of the disease appears the least dangerous.

TREATMENT:—Finding his patient down—as will generally be the case—it will become a question with the practitioner, should he have the necessary apparatus at hand, whether or not it appears advisable to raise the horse into slings. In most instances I should say it will: in the erect posture he will be more conveniently bled, and have administered to him whatever else is required; and besides, the spine will be set up in its natural position: it will seldom happen, however, that the animal can with advantage be kept long in such confinement.* Should the accident which produced the palsy be of a nature, or the interval that elapsed between the accident and the supervention of the paralysis be such as, to lead the veterinarian

* For an account of the improved method of suspension, vide vol. i, p. 228.

to imagine the symptoms are arising from extravasation of blood, immediate bloodletting, to the extent the animal's age and condition will tolerate, will be proper, and this may be succeeded by a terebinthinate or opiate drink: the twofold object being to arrest hæmorrhage, should it be going on, and promote the absorption of the blood already effused. In a case in which much irritation prevails, or where there is any sign of inflammatory action, or where plethora is an attendant, a full and early bloodletting is likewise peremptorily called for; and this ought without hesitation to be repeated, providing the febrile symptoms do not give way. The next thing to be done is, to administer an aloetic enema, to clear out the posterior bowels; and this may be succeeded by a dose of cathartic medicine. In regard to local applications, in paraplegia, I know of nothing so likely to prove of service as virulent stimulation of the loins: I have seen the mustard-plaster—which, to render it speedier and sharper in its operation, may be composed with oil of turpentine—when spread upon the loins shorn of their hair, act like a charm: no sooner has it come into full action than the patient, to the surprise of all around, has risen upon his legs and commenced feeding; signifying, that not only has the power of motion been restored to him, but that he has likewise been relieved of his pain. The *acetum cantharidis* might likewise prove a very good application. I should say this would form a proper case for dry cupping; or, upon the bare skin, even the scarificators may be employed with advantage, the object being not so much the blood abstracted as the counter-irritation produced. Afterwards, and especially in chronic cases, setons may be inserted with a remote prospect of considerable benefit. In all cases the bowels should be kept soluble by *enemata* during the continuance of the palsy. Mr. Read, the ingenious inventor of the improved stomach and enema syringes, has recently called upon me with an apparatus for giving a horse a steam-vapour-bath; a most desirable thing, certainly, could it be brought—which I fully believe it can be—into practice, and very likely to prove beneficial in cases of paralysis.

In hemiplegia and general paralysis—in any case, in fact, in which the brain is the seat of injury or disease, to that part,

and not to the spine, our treatment must of course be directed : congestion, or inflammation, or infusion, may be present, and call for the same remedies as are recommended in encephalitis. In fine, our grand object must always be to seek out the primitive affection, to discover whether the palsy be directly the consequence of lesion or altered condition of the brain or spinal marrow, or proceed from some irritation in another part, proving the result of a reflex impression along the nerves, through the medium of their common cerebral or spinal centre.

THE PROPER SITUATION for the patient is a loose box. And when slings are not used, or even when they are, as patients in general cannot for any great length of time be kept in them, particular care should be taken that the horse does not lie too long upon the same side :* he should every now and then be turned over, and never turned without having placed under him fresh, clean, and dry litter ; otherwise excoriation, and even ulceration and sloughing, may be the consequence.

OTHER PLANS OF TREATMENT have been adopted, with varied success, by different veterinarians. I will mention such as have been employed on the Continent, and afterwards those that have proved most serviceable in our own country. M. Jacob, in paraplegia, inserts setons in the thighs, and rubs the hind limbs with camphorated ammoniacal liniment ; applies poultices to the loins, and gives opiates and quinine. Bouley, who has paid especial attention to this subject, and has had great opportunities of observation, places most reliance in emissions of blood, regarding all other remedies but as auxiliaries, and wisely insisting on the vast importance of *early* and *copious* bloodletting, and of a repetition of this, even at a short interval of three hours, should circumstances warrant it. Charlot has exhibited, after bloodletting, *nux vomica* with advantage, in doses up to 45 grains, French : Clichy has given as much as six drachms at a dose. Mr. Snewing, V.S., Rugby, in a case of a yearling filly, who, by slight immobility and un-

* Mr. Spooner, veterinary surgeon, Blandford, relates a case of tetanus, in *The Veterinarian* for 1830, wherein "the serratus magnus muscle of the near-side was found in a state of approaching gangrene ;" supposed to "have been occasioned by the mare's having lain upon that side for twelve or fourteen hours preceding her death."

steadiness in walking in the hind quarters, with the peculiar dragging movements in both hind and fore legs, by the comatose state into which she sank after exertion, and the unnatural position in which she would often stand, and by unusual dilatation of the pupils and a shining glassy appearance of the eyes, and evident partial blindness, evinced some paralytic affection, appeared to confer much benefit, after bleeding and purging, by administering daily a drachm of the powdered nux vomica, in combination with small quantities of iodide of potash and calomel. Coulbaux, in addition to bleeding from the jugular, amputated the tail, with a view of drawing blood topically as well as generally; and the expedient is by no means unworthy of our notice, although his case proved an unsuccessful one. Bouley, with the same object, in one instance opened the saphena veins. Preau, in a mare seized with paraplegia, after applying the *moxa* and budding-iron to the loins, made several experiments of the powers of galvanism, and by its application enabled the animal, after a short time, to rise and stand upon her legs, and, indeed, appeared to have conferred so much benefit by it, that she, being rendered able to go about, was turned out, convalescent: at pasture, however, she became emaciated, and died. Acupuncturation has been practised by some continental veterinarians, but with no great deal of success; still, there are cases in which it may be worth a trial. M. Clichy, in one instance, found the skin of the quarters and thighs so hard and unyielding, that the needle could not be introduced. D'Arboval informs us, that the treatment employed in the epidemic paralysis which prevails on the borders of the Seine, near Mantes, consists in plentiful bloodlettings, cold bathings, &c.; and that the benefit of this treatment manifests itself on the second or third day. From the same authority we learn that nux vomica is not suited to an acute or recent case of paralysis; and that it is wrong to recur to its use in any instance after it has once failed.

A PROPER PRECAUTION, in most cases, is a manual examination *per rectum*; by this, the practitioner not only becomes informed of the condition of the posterior bowels and bladder, but has, on occasions, unriddled the nature of the malady, which, but for this simple operation, would not have come to

light until after death. The following very interesting case sent to *The Veterinarian* in 1840, by Mr. Spooner, V.S., Southampton, will strikingly illustrate this :—

Muscat, a grey Arabian stallion, fourteen years of age, the property of Lord Palmerston, by whom he had been several years used as a stallion, was perceived to manifest considerable weakness in his hind quarters. When led out, “he somewhat reeled in his walk, and, when made to trot, he did not advance his legs under his body as he ought to have done. This weakness was most perceptible in turning.” When he had mounted a mare, which he did with as much desire as ever, he “could not advance far enough to effect a penetration.” Although for a couple of months after this he maintained his condition, then his *glutei* muscles were perceived to waste; and his hind legs, particularly the near one, to become œdematous. At the earlier part of his illness he evinced no pain on pressing the loins; but latterly he has flinched a great deal; and now, after lying down, experiences much difficulty in rising. In another month, Muscat could not retain his urine. About this time Mr. S. examined him *per rectum*, and, “about twelve inches from the anus, could distinctly feel a hard tumour of considerable size adhering closely to the spine, and situated mostly towards its left side.” Finding the case hopeless, Mr. S. recommended that Muscat be destroyed.

A large tumour was discovered closely adherent to the last lumbar and first sacral vertebræ, of a dark colour, somewhat like a gland in appearance, several pounds in weight, and occupying the space of two human hands. It had so pressed upon the posterior cava and iliac veins, that their external coats had become absorbed: the caliber of the vessel being lessened, accounted for the œdematous legs. The nerves, the sciatic in particular, must also have suffered considerable compression. Besides the principal one, there were several small tumours in the neighbourhood, and similar were found, in a diminutive form, in nearly every muscle in the body. There was one about the size of a small egg, which could be felt above the elbow, and this had been there ever since he had been in his lordship’s possession: the grooms used to say it was a pistol-shot. Natives of Arabia are, Mr. Spooner believes, peculiarly subject to hard black tumours, which penetrate often to the bone. “Can this,” Mr. S. pertinently inquires, “in an Arabian horse, be of a similar nature?”

TETANUS—LOCKED JAW.

THE word *tetanus* is of Greek extraction, and literally signifies “stretching.” Its application to the disease we are about to consider appears to consist in the appearance of *tension*, which their rigidity and hardness give the muscles of the body,

in consequence of a spasmodic contraction of their fibres. By some of the old writers on farriery we find the disorder called *stag-evil*—an appellation derived from the French, *mal de cerf*—not from any peculiar liability of the deer to the complaint, but, apparently, from the resemblance there exists between the stiff and erect carriage in his walk of the tetanic horse to the natural stalking gait of the stag. We have the authority of D'Arboval for asserting, that all our domesticated animals are obnoxious to tetanus, and that the order of intensity of predisposition runs thus:—first, the ass; next, the mule; thirdly, the horse; then the dog, the sheep, the ox.

THE MUSCLES AFFECTED are the voluntary. The acts of volition are either entirely suspended or else are performable with so much difficulty and pain that the animal can hardly be induced to move. The involuntary muscles are not, in general, spasmed, at least not in the incipient stages; though a good deal of disturbance of the actions of some of them is, on occasions, evinced in the latter stages; contradicting the assertions of Cullen, that the secretory, respiratory, and digestive functions remain imperturbid. Though his general insensibility is painfully increased, neither in the animal nor in man are the intellects impaired. The horse is watchful and anxious about what is going on amongst his attendants, and, to the last, continues sensible and obedient; verifying in the brute what Larry observed of the tetanic man, that he may be said actually to “see himself die.”

THE MUSCLES MOST SUBJECT TO SPASM are those of the lower jaw, neck, and back. When the muscles of the jaw are exclusively spasmed, the disease is named *trismus* or *locked jaw*; and these appellations are often used—incorrectly however—synonymously with tetanus, to denote the general disease; a circumstance that seems to have arisen from the notice in particular which is taken of the jaw being “locked” or immoveable, to the disregard of the spasm in other parts of the body. When the muscles of the neck and back exhibit the greatest spasm, occasioning the patient to carry his head stiffly erected, his neck rigidly ewed, and his back crouched, the disease is characterised by the term *opisthotonos*; when the reverse is the case, the muscles of the inferior parts of the body

being most affected, and the animal, in consequence, is forced to roach his back and contract his belly and flanks, the name of *emprosthotonos* is given to it : should the body be drawn by the spasm to one side, that of *pleurosthotonos*. Of these varieties trismus and opisthotonos are most frequent. The limbs are seldom spasmed to the degree that other parts are ; at least not early in the attack : and in consequence of this it is that the horse is able to walk, even at a time when his jaw is immoveably fixed, and that he has no power of flexing either his neck or back.

THE DIVISION made of tetanus by writers in general is into *idiopathic* and *traumatic* : the latter designating that form or kind of the disease which results from wounds ; the former that which is said to have a spontaneous origin. Dr. Marshall Hall, in consonance with his doctrine of excito-motory pathology, has proposed to make the division into *central* and *centripetal* tetanus : the first indicating that disease which originates within the spinal canal ; the last, that produced by wound, or “ other source of eccentric nervous and convulsive affection, as deranged stomach or bowels, worms, &c.” Of the two classifications, I must confess I regard Dr. Hall’s as the one most consonant with all we profess to know about the source or origin of tetanus ; and therefore I prefer it, and shall not, as I proceed, lose sight of it.

TETANUS IS EITHER ACUTE OR CHRONIC, according to its intensity and rapidity of progress. Traumatic cases are in general of an acute character ; they are rapid in their course, and fatal in their termination : whereas, such as have their origin in other causes are apt to be comparatively tardy in their progress, and, for that reason, afford us more chance of cure.

TETANUS IS EPIDEMIC OR ENDEMIC whenever it becomes unusually prevalent, or shows itself in particular localities to an unusual extent. There have been seasons in which tetanus has so commonly supervened on injuries, that practitioners have dreaded its appearance on every occasion when a horse has been brought to them for scratches, or punctures, or wounds of any sort ; and in this epidemic form the disease has, unfortunately, been observed to be unusually fatal in its tendency.

THE TRAUMATIC SPECIES OF CENTRIPETAL TETANUS is the

disorder we are commonly called to treat ; indeed, so prevalent is this form of the disease over the others, that, when a tetanic horse is brought to us, he is, as a matter of course, supposed to have a wound of some sort about him : very likely it will be found in one of his feet ; if not there, it should be sought for elsewhere.

THE CAUSES, in the shape of injuries, of this form of the disorder, are very various, sometimes very trifling. M. Karkeek, V.S., Truro, met with a case which had originated in the skin underneath the eye simply having been broken by the lash of a whip. The late Mr. John Field mentions one case in which all that could be found to account for it was a saddle-gall ; and another, where there existed only a wound in the neck. The most common cause is a wound in the foot—a puncture from picking up a nail, or from being fresh shod—which has gone on, unobserved, to fester. A simple tread may produce it. Both docking and nicking have been followed by tetanus. On one occasion it succeeded cauterization of a bleeding jugular vein.*

TETANUS HAS FOLLOWED STRANGLES.—In a case extracted into *The Veterinarian* for 1828, from M. Durand, V.S. to the French Artillery, this occurred at a period of three weeks from the first detection of the tumour, and a little less than one after perfect maturation and discharge of the matter by lancing. A similar case is narrated in the same Journal for 1835, by Mr. Karkeek, with the important addition of the presence of stomach and intestinal irritation.

TETANUS HAS PROVED THE SEQUEL OF CASTRATION.—D'Arboval informs us, that at a remount dépôt for cavalry established at Bec (département de l'Eure), twenty-four horses were castrated on the same day, and afterwards were, four times a day, made to take a cold bath in water derived from an eminently cold spring ; the consequences were, that sixteen out of the twenty-four died of tetanus between the tenth and fifteenth days. The Americans, who use the actual cautery in the operation of castration, experience tetanus so frequently afterwards, that a gelding is worth double the price of an entire horse.

* The case, which is interesting in other respects, will be found with some excellent comments on it in *The Veterinarian* for 1832.

TETANUS MAY SUPERVENE ON ANY STAGE OR STATE OF THE WOUND : the suppurative, however, appears the most inductive. The disorder may even arise after the wound has healed and cicatrized.

THE FOURTH DAY has, on several occasions, proved critical of its appearance. In one of Mr. Field's cases the disease seized the horse "within an hour after (the occurrence of) a wound occasioning immediate and excessive pain." It has frequently appeared as late as three weeks after an injury. At St. Domingo, where the disease is prevalent, it makes its attack generally during the rainy seasons, September and May.

HORSES OF ALL AGES experience tetanus. In *The Veterinarian* for 1831, Mr. Dickens, V.S., Kimbolton, has recorded a case of extraordinary youthhood. It occurred in a filly only a fortnight old, who was attacked at her dam's side, and died of the disease. From the circumstance of the umbilical cord having been broken off unusually short, and appearing to be the only place where traumatic irritation could exist, Mr. D. was naturally induced, after death, to examine it : and it proved fortunate he did ; for he found the umbilical arteries, quite up to their origin from the aorta, full of pus, and in a condition approaching to gangrene.

HIGH-BRED OR IRRITABLE HORSES may be expected to take tetanus from causes under which low-bred horses, or such as are of an indolent phlegmatic habit of body, would escape. In animals, as in ourselves, there is a peculiar make and temperament that is evidently nervous, and may be said to be tetanic ; opposed to which is another idiosyncrasy wherein the disease is hardly ever seen.

THE SYMPATHETIC DISORDER, as I shall call the other form of centripetal tetanus, is that which, from the absence of all wound or injury, we have got into the habit of considering as *idiopathic* ; though in point of fact, while some cases so considered are, no doubt, *central*, i.e., originate within the spinal marrow, others, there seems good reason for believing, must be dependent upon some irritation, either within the alimentary canal, or in some other part of the body. Should this turn out to be the case, our pathology of tetanus will have undergone essential improvement ; and we shall be able to account,

in a measure, for our therapeutic agents succeeding in one instance and failing in another; a fact that has hitherto led us either to regard the asserted remedy as useless, or to attribute its failure or success to an erroneous source. In a word by endeavouring to discover the real seat and nature of two kinds or forms of disease, which have hitherto been confounded under the epithet *idiopathic*, it is manifest we are in the road to very considerable amendment of our method of treatment.

We are informed from various sources, that tetanus has been produced in horses by excessive heat, by excessive cold, by change of temperature, by low wet pastures, by suppressed perspiration, by over-exertion, by worms, by certain waters given to drink, by certain kinds and descriptions of aliment, &c. Without calling any of which statements into question, I may observe, that, supposing such cases do happen, they are evidently, all of them, but so many instances of irritation of the nervous fibre, the influence of which—the same as wound or lesion of the nerve—is, in the language of Dr. Hall, “carried by excitor nerves to the spinal axis and reflected upon the motor nerves;” and this irritation is capable of pursuing “a retrograde course along the spinal marrow;”* a wound in the hind foot being not less capable than a wound in the fore of inducing a locked-jaw.

Mr. Abernethy was of opinion, that the injury, whatever it might be, leading to tetanus, first produced disorder of the digestive organs; that that disorder occasioned derangement of the functions of the spinal marrow, and, through it, of those of the system at large, which latter derangement constituted tetanus. The intervention of the influence of the digestive organs in the chain of connexive irritation appears, then, to be the grand difference between the theories of Dr. Hall and Mr. Abernethy. And on the side of the latter we may range the opinions of two members of our own profession, Messrs. Henderson and Karkeek, both of whom have bestowed a great deal of practical observation upon the subject before us.

Mr. A. Henderson, V.S., London, who presented the Veterinary Medical Society with a good practical paper on tetanus

* ‘Diseases and Derangements of the Nervous System,’ by Marshall Hall, M.D.

in 1832, "doubts that the horse has never the disease except from sympathy;" and in confirmation of this opinion states, that, although during life the symptoms have proved insufficient to direct his attention to the seat of the source of irritation, examination after death has manifested appearances, which left no doubt on the mind of Mr. H. about the nature of a case which he had at first considered to be idiopathic, i.e. central. And in the position which Mr. H. has taken up, I am very much disposed to think, that (although I do not believe his theory complete) he stands very strong. I feel no doubt, myself, that a very large proportion of our cases of tetanus originate either from wound, discovered or not discovered, or from some other cause of local irritation; and that cause Mr. H. has found frequently to be, "an unusually vascular appearance of the large sympathetic nerves throughout their various ramifications in the chest and abdomen." In one case, in combination with this appearance, he found distension and redness of the stomach, with crimson spots upon its pyloric portion; in a second case, with the same, an enormous quantity of bots, several of which had eaten through the coats of the stomach; in a third, with the same, an immense number of the worms called *terites*, in the stomach and small intestines and in some parts of the duodenum and jejunum, sufficient to block up the passages. The vessels of the pia mater were also unusually distended, the brain in this case being examined; and there was more water than usual in the ventricles. To this it may be right to add, that Mr. H. found the sympathetic nerves similarly affected in a case of tetanus apparently caused by broken knees. Mr. Karkeek, V.S., Truro, has made the same observation since, in idiopathic tetanus; and in regard to it, coupled with the consideration of other facts, sagaciously remarks, that "tetanus depends, if any disease does, upon sympathy." And in another place, "I am of opinion that a diseased state of the digestive organs is invariably the primary cause, as on dissection I have ever discovered it to exist:" thus confirming Mr. Abernethy's opinion.

CLIMATE.—Mr. Karkeek believes the climate of West Cornwall to be favorable to the production of tetanus, on account of the land being almost surrounded by sea and bordering so

closely upon it. Mr. K. has likewise observed the disease to be more prevalent in marshy grounds than in places dry and elevated; and has accompanied his observations with the remark that a cure is more likely to be effected in the latter than in the former situations.

TEMPERATURE.—The late Mr. Henderson, V.S., Edinburgh, sent the particulars of a case of tetanus to *The Veterinarian* for 1839, wherein the exciting cause appeared to have been a “cold stable, with an insufficient roof through which the rain had fallen upon the horse,” already “in low condition, and probably labouring under some derangement of the digestive organs.” A similar case is recorded by Mr. Spooner, V.S., Blandford, in *The Veterinarian* for 1830: his words are:—“I considered the tetanus to have been caused by exposure to cold. The mare (to whom the disease occurred) was turned out for a winter’s run with two other horses.” The cold proved most intense, succeeded by a thaw, during which, in consequence of her companions refusing to admit her under shelter, “she was exposed to the droppings from the thatch upon her hind parts.”

CENTRAL TETANUS may be defined to be, that kind or form of the disease whose seat involves the roots or origins of the nerves: this may be the brain; commonly it is the spinal marrow. Examples of such affections, and on record, do not appear to be wanting, though pathologists have not hitherto succeeded in making any digest of them likely to prove serviceable to us in practice. In a large proportion of cases of centripetal and central tetanus, the brain sometimes, and a great deal oftener the spinal marrow, has evinced anormal alterations of some sort; mostly of vascularity, congestion, inflammation, effusion either between the membranes or into the ventricles, softening of the medullary substances, &c.; but there is not of these morbid changes one that we dare single out as proper to tetanus: we have far more reason for supposing, with Messrs. Henderson and Karkeek, that the disorder derives its origin in nervous sympathy, springing from an over-vascular or actually inflamed condition of the pyloric regions of the stomach and duodenum, or of the sympathetic nerve and its ganglia.

Messrs. Gellé and Leblanc, who have bestowed unusual pains

in opening and examining horses that have died of tetanus, have come to the conclusion, that the disease consists in an inflammatory irritation of the cerebro-spinal system, accompanied with softening of the spinal marrow; and that the inferior columns and the nerves taking their rise therefrom, which are the motor, are the parts especially affected: at the same time, they cannot help admitting that similar morbid alterations are occasionally observable in cases of paralysis; consequently the deduction still presses on our mind, that a something, of whose nature and presence we are in ignorance, exists as the peculiar or proximate cause of tetanus. As for the discoloured and ecchymosed condition of the spasmed muscles, which has been observed and noticed by the same investigators, that appears little or nothing more than might be expected to follow the long and intensely contracted state of their fasciculi.

The exclusive presence of trismus affords no tenable argument against the spinal marrow being regarded as the seat of central tetanus; for the irritation, whatever it may be, is, as we have seen, “capable of taking a *retrograde* course along the marrow to the brain.” The irritation may, however, originate in lesion, or disease of the brain itself, of which the following case, sent to *The Veterinarian* for 1834, by Mr. Skeavington, late V.S. to the Bengal Horse Artillery, is beautifully illustrative:—

A horse belonging to that corps was brought to Mr. Skeavington for “having had his head cut by running violently against a cross-bar which is in the cavalry stables at the head,” occasioning a wound, apparently only of the skin, that was sewn up, and promised to be well in a few days. Next morning the horse’s head felt extremely hot, and his mouth was dry, and pulse 50. He had a gallon of blood taken away, and took aloes ʒss, &c., and had his head bathed with warm water. On the 4th day the sutures gave way, and the wound gaped open, and looked healthy. On the 8th day the wound was quite filled up. On the morning of the 22d day the horse “appeared to move rather stiff;” and Mr. S. found the jaw protrude more than usual, the muscles of the neck stiff and rigid, which symptoms led Mr. S. to believe “that tetanus was a near neighbour.” 23d day.—The horse cannot separate his jaws—cannot eat. Mr. S. had him cast, and made two oblique incisions, laying open the apparently healed wound, which disclosed a fracture of the cranium on the parietal suture, and a piece of splintered bone, which was removed, and the wound afterwards sewn up. 24th day.—Worse. 25th day.—Cathartic medicine operating: much relieved. 27th day.—

Better: ate a little grass and corn. 35th day.—Has been gradually amending, and is now well enough to discontinue medicine, and take exercise. His treatment consisted in bloodletting and purging, and attention to the cranial wound.

The SYMPTOMS of tetanus are of that strikingly remarkable and even appalling character, that a person who has once witnessed the disease in its confirmed stages never afterwards seems to have the impression it has made erased from his mind. In its earliest onset, however, it requires an experienced eye to detect it.

AT THE BEGINNING, the horse is observed to carry his neck unusually stiff, and to evince some unusual inflexibility in the movements of his back and loins. The owner complains of this, and soon discovers that the animal does not feed with his accustomed appetite. He imagines this to arise from sore throat, and seems confirmed in this opinion from some difficulty the horse evinces in swallowing. Should he attempt to open the animal's mouth with a view of examining its interior, to his surprise, he finds the jaws separable only to a short distance, though the lips possess their usual mobility, and there issues from between them a discharge of saliva. Moreover, he finds the horse unusually irritable; cannot bear to have his head pulled about; every time the groom attempts to lay hold of it, he throws up his head, and at the instant he does so the haw is protruded over the sight of the eye. Such symptoms leave no room for doubt about the presumed, or rather actual presence of tetanus or locked jaw.

TETANUS IS CONFIRMED when the spasm has extended to the muscles of the body generally, and the horse stands, stiffened in every part, with his head erect and his limbs stretched out, as though he were a stuffed horse, or but the ghost of the animal he was in health; indeed, with his neck contracted into the form called "ewed," and his head drawn upwards and backwards, the horse assumes the deer-like aspect, which gave rise to the disease being called the "stag-evil." The tetanic countenance is very characteristic; it has a sort of terrific expression, and, as the fatal termination draws near, turns haggard and ghastly. Every time the patient is excited the eyes assume a wild, fixed stare, and look almost as though they were

ready to start from their orbits, the haws issuing over them like a shield, whenever the head is raised or moved : on other occasions, when no agitation prevails, the eyes appear dull, and even sunk in their orbits ; the ears are erect and rigid ; the muzzle protruded ; the nostrils dilated. Should medicine have not been given during the onset of the disorder, the probability is, that the jaws by this time are so far locked as to render the administration of either ball or drench an affair of extreme difficulty, if not total impossibility.* When the animal moves—for he is still able to walk—the veterinarian of experience observes tetanus in his gait, as far off as he can observe him : locomotion evidently puts him to a good deal of pain ; his fore limbs reluctantly and stiffly take short steps in advance, while his unbending hind legs straddlingly drag after them ; and when he turns, so rigid has his body become, that from head to tail the spine remains inflexibly straightened, like that of a horse said to be “ricked”† in the back or loins. The tail is erected, and commonly has a continual tremulous motion. The coat stands on end, and the skin feels tight and harsh. The belly is tense, and towards the flanks is much drawn up, giving them a hollow appearance. The respiration and pulse often remain, for some time after the commencement of the attack, undisturbed ; in other cases the breathing soon grows quick and irregular, and there is present a troublesome cough ; and now and then, at an advanced state of the disorder, such is the oppression in the breath, and consequent palpitation at the flanks, that the veterinarian finds it necessary to perform the operation of tracheotomy ; and this operation generally affords the desired relief ; the panting and distress being occasioned by spasms seizing the muscles of the glottis, which, but for such timely relief, might induce even suffocation and death.

* In *The Veterinarian* for 1837 is an account of a case of locked jaw treated by a farrier, who introduced an iron crow-bar between the tushes and grinders through the mouth, from one side to the other, with a view of enabling a couple of men, placed on each side of the horse, by means of it, to force open the mouth. Their efforts proved unavailing. This relic of the age of veterinary barbarism will tend to show the amount of power exerted by the spasmed muscles on the closed jaws.

† This looks like a corruption of *rickets* or *rickety*.

Under these circumstances the pulse becomes accelerated, and at times acquires such extreme irritability that the least disturbance or alarm will hurriedly run it up to double its former quickness. In regard to the pain the poor animal all the while is suffering, some conception may be formed of it, as Mr. Lawrence has happily observed, by the sharp pains felt by a person experiencing cramp in his leg: tetanus is a continued cramp all over the body, and the consequent suffering is in some cases dreadful, judging from the high state of irritation our poor patient is in, his extreme restlessness and anxiousness, his occasional perspirations, shivering fits, &c. And yet there are remissions of the spasms—times when the patient suffers less—to dread and feel the more on the accession of the next paroxysm. The bowels generally are constipated; the urine scanty and high-coloured.

THE LATTER STAGES are marked by an extension of the spasm to the limbs, rendering our unfortunate patient all but a fixture to the place where he stands; for should he attempt to move, retaining little or no power over the muscles, there is great risk of his falling down. And now the animal's aspect becomes wan, and his body begins to show, in falling away, the effects of irritation and pain, and of deprivation of aliment. Towards the close of the sad scene, the respiration becomes more embarrassed; the pulse accelerated more, and then, irregular, intermittent, imperceptible; cold sweats and rigors seize the body, during the continuance of which the spasm appears to relax. But, alas! fatal truce; our poor patient is now on the point of death: either he stands to the last and drops down dead; or he falls headlong, and expires in convulsions.

THE DURATION OF TETANUS is various. In general it may be said to last from one to three or four weeks. Death has ensued so early as the second day: commonly, in rapid cases, it occurs about the fifth or sixth day; sometimes the twelfth or thirteenth proves fatal. When symptoms of recovery reward our endeavours, the favorable change may often be dated from the tenth day. Should the tenth and following day or two pass without any sign of amendment, we may begin to despair of our patient.

OUR PROGNOSIS from the beginning must be one of hope-

lessness. With a few remarkable exceptions—most of which will be found recorded—tetanus and death have proved but cause and effect. In man, traumatic cases are accounted a great deal more dangerous than others; and the same observation holds good in respect to horses: most of the instances of recovery turning out to be cases of central tetanus, and remedies which appeared to have proved curative in this, manifesting no such efficacy in the centripetal form of the disease. When the case, therefore, is not of traumatic origin—the spasm neither severe nor universal, not such as to lock the jaws to that degree that neither food nor medicine can be taken—and so long as the voluntary muscles exclusively be affected, the breathing and pulse remaining little or nothing disturbed, hope may reasonably be entertained of our patient.

TREATMENT.—This, I fear, will turn out the least satisfactory part of our account. Tetanus is one of those diseases with whose nature we are but imperfectly acquainted, and over which in its worst forms medicine exerts its power in vain; in the emphatic language of our excellent and elegant writer, Mr. Karkeek, “there are few things that show so substantially the mighty and awful power of disease, and of our incapability of arresting its progress, as to see a fine noble horse die tetanic.” Nevertheless it is our duty to set about our task energetically, and in accordance with the best rules of our art. Our treatment, in whatever it may consist, must have regard to the origin, the kind, the stage, the intensity of the disease, and the age, constitution, and condition of our patient. The traumatic we have ascertained to be the kind of tetanus whereto horses are especially obnoxious; and this is one reason why the disease so frequently ends in death. The wound, therefore, whatever it may be—slight or severe, recent, or of some duration—apparently or by possibility giving rise to the tetanic disorder, of course becomes an object of peculiar interest in the treatment.

TRAUMATIC TREATMENT.—The removal or destruction of that from which the disease is supposed to have taken its origin, and which possibly may still prove a source of irritation, has always been considered a primary object in the treatment: accordingly, surgeons have amputated wounded limbs to cure tetanus; have excised or destroyed by caustic, wounded or

abraded surfaces, and so forth ; and the same has been practised to the extent it was allowable by veterinary surgeons ; and I would I could add, that these operations had been followed by the happy effects which, theoretically, they seemed to promise. It has been argued that, as the tetanus is caused or kept up by local irritation transmitted to the brain, so, if the source of the irritation be annihilated, or the nervous chords through which it is conveyed to the brain be divided, the sensorial disturbance, together with the spasms dependent upon it, ought to cease. And in some few cases, and particularly where the disconnection has been effected at an early period, such felicitous results have followed : in others, however, no apparent advantage whatever has been derived from these operations. Baron Larrey indeed observes—"les extirpations du bras et les amputations des jambes furent généralement heureuses ;" but then it must be remembered, this observation had its origin in the Baron's practice during the Russian campaign, where amputation was performed the moment the disease manifested itself : on the other hand private practice has shown in too many instances that delay is fatal to success. Sir Benjamin Brodie advises that the entire injured nerve or portion of nerve be removed. The late Mr. John Field was in the habit of applying lunar caustic freely and extensively to any wounded or abraded part. Mr. James Turner, in a letter to the Editor of *The Veterinarian*, in 1832, represents his practice to be "to make not only deep crucial incisions with a scalpel within the wound, but also numerous incisions through the sound skin in the vicinity of the wound, and sometimes to surround it in this manner," his object being twofold :—to release any "embarrassed nervous fibril ; and to create a *new action*, or rather *the return of vascular excitement*, in the part injured." "And whenever," adds Mr. Turner, "this counter-irritation has been succeeded by a counter-suppurative, the cases have invariably done well ; but it would be vain to look for such a result in a protracted case." Mr. Turner has likewise observed, that, after the operation of docking afresh for tetanus, the exposed surface of the stump of the tail assumes a livid deadly aspect, indicating "a most apparent loss of energy in the arterial trunks, the jets of blood from them wanting that vigour which

exists in the healthy adult horse ;” and that “the blood in the venous trunks is literally *as black as ink*.”

Should the disease ensue on docking or nicking, fresh amputation of the tail, being a simple and readily performable operation, had better at once be had recourse to; it being borne in mind that not much benefit is to be expected from it should the divided stump assume the appearance described by Mr. Turner. Where excision can be practised, it is preferable either to division of the nerves, or to the destruction of them by caustic, the grand object being to extirpate or annihilate the whole of the injured nervous structures. In a case of a sinus in the foot, we cannot accomplish excision, and therefore we must content ourselves with the use of caustic; or we may employ the actual cautery, should the case seem to warrant it. A very good application to the part afterwards, in general, is an ample hot linseed-meal poultice. And though, from such operations at an advanced stage of the disease, experience forbids us to expect any good result, still exists in our minds that glimmering of hope that induces us in most cases to put them to the test. Mr. A. Henderson witnessed a case of tetanus, produced from a wound in the foot, cured by neurotomy;” but has known the operation “in other cases fail:” and the same remark may be made of one and all of the measures of traumatic treatment.

COPIOUS BLOODLETTING appears in the generality of cases to have been practised with decided benefit. When symptoms of fever are present, it is evidently indicated: and when spasm is unattended by any febrile action or irritation, it seems to be productive of good as an antispasmodic. The extent to which it is to be carried must be regulated by the state of the patient, and the good or bad effects it appears to take on him: sometimes it may prove advisable to repeat the evacuation as often as the animal can bear it; at other times, one or two plentiful abstractions may be all that seem beneficial or bearable.

MEDICINE, of whatever description it may be, as a general rule, ought in tetanic affections, on account of the torpid insusceptible condition of the alimentary canal, to be exhibited in doses doubly strong to what we should think of prescribing in any case of ordinary disease; and, moreover, it should be

administered as early as possible after the disorder has manifested itself, lest the jaws get locked, and its administration, in the form or quantity we could have desired, becomes difficult or impossible.

A STRONG PURGE is generally given in the first instance to clear out the bowels. And when we come to reflect on the appearances of derangement and irritation which have at times presented themselves in the stomach and bowels of horses that have died of tetanus, purgation seems to be a most proper beginning. In order to insure it, at least an ounce and a half of cathartic mass, with which may advantageously be combined from one to two drachms of calomel, ought to be administered. The form of ball is that which best insures success: should one prove too large for administration, it may be divided into two or three; and when the hand cannot be introduced, the shooting-stick, or simply a piece of cane or whalebone may serve to convey small balls, one by one into the pharynx. Should the form of drench be preferred to that of ball, a very potent and effective formula will be found in a combination of aloes and linseed oil: an ounce of the former melted over the fire in a pint of the latter, constitutes a cathartic mixture of great power, and by some practitioners is the dose generally prescribed. By others, croton powder is preferred; or the oil may be given. For my own part, I like the compound cathartic ball. When the jaws have once become spasmodically closed, we are glad to get anything swallowed in the shape of purgative medicine: should the animal be found willing and able to drink, we may stir some croton powder into his water, and try to cajole him with that; or we may endeavour to introduce an œsophagus-tube as a conduit for medicine. Now and then, when trismus has so advanced before we are called to the patient that all our manual efforts to separate the jaws prove fruitless, we shall find that a decided bloodletting will have such an effect on the spasm as to enable us to accomplish our purpose. When once we have succeeded in opening the bowels, we must take every precaution by medicine and enema to keep them soluble; for the spasm is very apt to show aggravation or relapse whenever the body is suffered to become constipated.

A WARM BATH would no doubt afford a good deal of relief, from its tendency to relax spasm—supposing even it could not be reckoned among the means of cure—could one anywise be obtained or contrived. Mr. Read, the ingenious inventor of the bivalvular enema and stomach syringe, has been lately engaged in some experiments towards the accomplishment of this desirable object, by means of steam, and it is my firm opinion that in the end success will be attained, and our infirmaries will be furnished with apparatus for the purpose. Some practitioners cover the loins and other parts of the body with fresh-flayed sheep-skins. M. Lacoste, V.S. to the dépôt at St. Lô, has addressed to the Royal and Central Agricultural Society of France a memoir on traumatic tetanus following castration, wherein are recounted eight cases successfully treated by repeated steam-baths, along with the exhibition of opium to the extent of ʒiiss in the course of twenty-four hours, aided by narcotic injections (*Veterinarian* for 1837).

OF THE COLD BATH I saw the effects in early professional life, on some tetanic horses that were brought to the Veterinary College for treatment. The late professor Coleman, at that time an enthusiastic advocate for cold as a remedy—for, in fact, what now goes by the name of *hydropathy*—turned tetanic patients out of their warm stables into open yards without shelter, in the coldest seasons of the year, and had them, when the atmospheric cold was insufficient, kept continually suffused with cold water; and, from the sedative efficacy of the cold, some of them at first appeared benefitted by the change; in the end, however, the results were not of a character to induce a continuance of so severe a mode of treatment. Since these first experiments, Mr. Youatt has, in the most decided manner, given the effects of cold a fresh trial; but, in his own words, though “some slight remission followed,” the end was not marked by any “decided good effect.” In human medicine, a plunge into a cold bath has been known to prove almost immediately mortal to the poor sufferer.

SPECIFIC MEDICINES for tetanus we, in truth, possess none. Among the many which at one time and another, in human or veterinary medicine, have been lauded as such, we may mention, as standing in the highest repute, opium, mercury, cam-

phor, digitalis, hellebore, belladonna, hydrocyanic acid, hemlock, henbane, and tobacco.

OF OPIUM I can speak from my own practice. I attended a horse belonging to the Enniskillen Dragoons for tetanus supervening on broken knees. After free bloodletting and purging, I prescribed two drachms of opium to be given in a ball, morning and evening. He continued to take the medicines regularly for ten days, making altogether five ounces of solid opium; by which time he had so far recovered as to render farther treatment unnecessary. I ought to add that, while taking the opium, his bowels were kept soluble by occasional doses of cathartic mass, and the daily administration of aloetic clysters.

The late Mr. Henderson, V.S., Edinburgh, also succeeded in curing tetanus by the exhibition of opium in still larger doses, viz. three drachms thrice a-day. The case is contained in *The Veterinarian* for 1829.

MERCURY.—The late Mr. John Field was in the habit, after bloodletting and purging, of anointing his patient with a mercurial soap: a practice he adopted from his respected father, and one in which they both placed great confidence.

DIGITALIS.—Mr. Saunders, V.S., Wolverhampton, had two cases of tetanus recover under the exhibition of doses of two drachms of digitalis with three drachms of camphor, alternated with aloetic purges, bloodletting being an accompaniment.

BELLADONNA has been prescribed with considerable success by Mr. Mavor, V.S., London, by Mr. Daws, V.S., London, and by Mr. Hutchinson, V.S., Wragley, Lincolnshire, in doses of three and four drachms. These accounts are to be found in *The Veterinarian* for 1837-38.

HYDROCYANIC OR PRUSSIC ACID had its power over tetanus in the horse first tested by Mr. Hayes, V.S., Rochdale. The doses he gave amounted to thirteen drops of Gay Lussac's, forty of Scheele's, or thirty of Magendie's, thrice a-day, in warm water. Mr. Daws has exhibited, both internally and in the form of clyster, drachm doses of the acid.

The HYOSCYAMUS NIGER has been successfully employed in doses of two drachms, in combination with hydrocyanic acid, by Mr. St. Clair, V.S., Morpeth (*Veterinarian*, 1839).

The EXTRACTUM CONII, in two drachm doses, in combination

with croton oil, has been given with success, by Mr. Freake, V.S., Northampton (*Veterinarian*, 1838).

TOBACCO ENEMA was used in a case of tetanus with apparent benefit by Mr. Egan, at the time assistant-surgeon in the 12th Lancers. The disease was traumatic in its origin. Copious bloodletting, purgatives, blistering the spine, &c., had been employed without affording relief, and the bowels still continued unsolved, when, at the suggestion of Mr. Egan, an infusion of tobacco was injected in the rectum, which produced "a discharge of dark-coloured fæces:" the enema was afterwards daily repeated, with the effect of abridging the duration of the paroxysms. For two days the injection was omitted; the consequence was, all the symptoms returned: it was resumed, and used twice or thrice a day, and under its employment the horse recovered.

THE PREFERABLE MODE OF USING TOBACCO appears from experience to be in the form of fumigation; with Read's syringe and a proper vessel for generating the tobacco smoke,* it may be administered as an enema, and persevered in twice or thrice a-day, until the bowels have become sufficiently relaxed. In this way it may be made subservient to the action of cathartic medicine; or when that cannot be or has not been exhibited, it may even supply the deficiency. And since all experience has demonstrated that it is of the greatest consideration in the treatment of tetanus to keep the bowels relaxed, this is likely to prove a very useful remedy.

COUNTER-IRRITATION, in the shape either of blisters or setons, has generally been regarded as an essential in the treatment. Commonly, the skin contiguous to and in the course of the spine has been blistered, beginning at the head and ending at the tail; but whether with any real advantage or not, seems, considering all that has been done besides, somewhat doubtful. Most tetanic affections originate in wounds of some sort; and many cases, on dissection after death, have indicated disorder in the alimentary canal, without apparent disease of the spinal marrow: one therefore does not see what great good in the generality of cases is to be expected from blisters or setons along the spine. The species of tetanus we have described as

* For a description of the proper apparatus, see vol. ii, page 242.

central, appears to be the only one likely to receive any benefit; but cases of this are rare. Mr. Karkeek, under the supposition of the stomach and bowels, or system of the sympathetic nerve, being the source or habitation of the disease, in several cases applied his blisters to the abdomen and breast, and inserted into the latter a rowel; and he thought benefit resulted from the practice: œdematous swellings underneath the belly, Mr. Karkeek having had reason to regard as a most favorable indication.

The CONSEQUENCES OF TETANUS, even when the animal recovers, are loss of condition and strength, and loss of action as well. Generally speaking, in addition to the more or less emaciated and debilitated state in which the patient is left, there is evident in his movements a rigidity or want of flexibility, owing to the effects or continuance of spasm, which for a long while unfits the animal for any kind of labour; and this may require some weeks—nay, months even—before it is quite got rid of. On account therefore of the expense, as well as for the benefit of the animal himself, the best situation for him, should the season be suitable, is the grass-field; but if the time of the year do not permit this recreation, the indulgence of a loose box or yard, with green-meat, if it can be procured, or carrots and other roots if it cannot, will best conduce to the restoration of the invalid.

SPASMS.

Spasm, spasmodic affection, cramp, are so many phrases used synonymously, to express that rigid contraction of a single muscle, or single set of muscles, which tetanus denotes of the muscles of the body generally. The fibres of a muscle in a state of spasm have the appearance of being, and are, in fact, in violent action: they feel hard, and are shortened and swollen, and the office they usually perform is executed without the consent of, or rather in opposition to, the will. In a word spasm consists in an involuntary contraction of a voluntary muscle. There are said to be two kinds of spasm—*clonic* and *tonic*. The clonic is the agitated spasm, called *convulsion*, wherein the contractions, although involuntary, alternate, with

oscillatory rapidity, with relaxations of the muscular fibres : the tonic being the tetanic, or comparatively permanent spasm.

Although I am not going to deny—on the contrary, I can, with many others, bring cases to prove—that horses are on occasions the subjects of spasm, yet I deem it prudent to caution my reader against the belief that every horse reported to be seized with “cramp” really is spasmed : for, now and then—spasm usually attacking the hind legs—he will find this asserted “cramp” to turn out a dislocation of the patella ; though oftener he will discover it to consist in spavin, either concealed or declared. Still, we do sometimes meet with horses having really spasmodic affections. I remember, while a pupil at the Veterinary College, to have seen some cases of excessive lameness of the hind legs which were at the time attributed to spasm of the adductor muscles ; the inner and prominent part of the thigh felt rigid and unusually plump, and the horse expressed pain when it was handled ; and what appeared to confirm the opinion entertained of the cases was, that they recovered seemingly from the treatment adopted ; which was, the rubbing into the part some stimulating embrocation.

In *The Veterinarian* for 1834 will be found a paper on “The Cramp in Horses,” by M. Prevost, V.S., Geneva. It informs us that both Soleysel and Garsault have mentioned the existence of this disease ; but that from then to the time he writes the subject has been lying dormant ; and after detailing seven cases, some of which certainly have the characters of spasm, he comes to the conclusion that there appear to be—

THREE KINDS OF CRAMP.—One which appears after rest, and lasts only a few seconds ; a second, which endures some days, but does not relapse ; a third, which returns at uncertain intervals, minutes or hours, and hence may be denominated *periodical*.

Mr. W. C. Spooner, V.S., Southampton, has, in *The Veterinarian* for 1835, with reason, called in question certain of Prevost’s cases, conceiving, from the account he has given of them, that both dislocation of the patella and disease of the hock might have been present and overlooked. Three out of the severe cases, however, Mr. S. is ready to admit might have been spasmodic in their nature.

Mr. Stewart, late Andersonian Veterinary Professor, Glasgow.

gow, in *The Veterinarian* for 1836, relates two cases which, in his mind, "establish the fact that horses are liable to cramp."

Slender as this evidence confessedly is, still, from the professional eminence of the parties by whom it is furnished, it is sufficient in my mind to dispel every doubt of the fact of spasm being a disease of the horse, a rare one though it be; at the same time, one we are on all occasions to hesitate to allow being present, without the most unequivocal symptoms in proof of it, combined with the absence of every other disorder which might by possibility produce similar infirmity. Were more than the respectable authorities I have adduced wanting to convince me of the truth of what has been asserted, I have only to cast an eye back upon my own practice. On several occasions, in the course of now nearly thirty years' experience, I have had horses brought to me "dead lame" and suddenly so seized, without being able to ascribe their ailment to any cause save spasm; an opinion which the rigid condition of the limb, and of certain muscles in particular, together with the loss of power and extreme tenderness of them, appeared to confirm. I remember one day riding from Hyde Park to St. James's Street, alighting there for a few minutes to make a call, and, on remounting, finding my horse so lame in one fore leg that I could hardly make him drag the limb forward. I instantly dismounted, examined the foot and leg, but nothing was to be discovered except some seeming rigidity of, and pain on giving motion to, the muscles in front of the shoulder: in fact, it appeared a decided case of spasm of the levator humeri. Not relishing the idea of leading my horse home, especially in the public thoroughfare where I had already become, on account of the limping of my horse, not very enviously conspicuous, I mounted again, and at all hazards raised my horse's courage with my spurs, though confessedly rather ashamed of myself for being observed to goad a "poor lame horse." Arriving at the top of St. James's Street, I was about turning his head towards the Park, when I thought he seemed to be recovering; I therefore pursued my ride into Bond Street, before I had passed along which and arrived at Oxford Street, my horse went again perfectly sound. He had one relapse, and only one, and on that day:

I never knew him, during the twelve months he remained in my possession, to have a similar attack either before or afterwards.

The SYMPTOMS denoting spasm in any one of the limbs are, sudden seizure with excessive lameness, limping, and stepping short, or actually dragging the limb, instead of making any attempt to put it forwards. In a hind leg, the effort to make use of it causes it to be caught up and thrown out in a most sudden and awkward manner; in a fore leg, there will be extreme limping, dragging, or hopping lameness; and yet, in both instances, while standing, the horse will place the feet upon the ground as though nothing were amiss with him. Compel him to walk, and his cramp will probably amend, and may after a time entirely disappear; on the other hand, it may continue, and so painfully as to make it seem like inhumanity to drive the animal on in his exercise. The muscles apparently most subject to spasm are the *levator humeri* and *adductores femoris*. The limbs will be stiffened by their rigidity, and the muscles themselves will feel firm and hard, and plump, as if they were swollen. The spasm in some cases is so transient as only to seize the horse at the time he moves, or rather is made to move; for, as Mr. Stewart has truly observed, when the horse moves of his own accord, which is but seldom, he occasionally does so without showing cramp. The hind limbs appear most liable to the disorder. Its duration may be very short, quite transitory, as in the case of my own horse, or it may last some hours; it has continued even days. Relapses are common, but not inevitable, they are best prevented by avoiding exposure to the causes or circumstances, apparent, under which the attack arose.

The TREATMENT must be for the most part speculative or empirical. As yet we know little, at least so far as horses are concerned, about either the etiology or pathology of spasm; indeed, we seem but just to have recognised, or at all events acknowledged its existence. We naturally have recourse to remedies reputed as *antispasmodics*. In a severe case, blood-letting would probably prove beneficial, general or topical; the latter being mostly preferable when performable. A strong cathartic will be almost sure to do good, by clearing out the alimentary passages, and getting rid of any latent or remote cause of spasm that may exist in them. In regard to the

spasmed muscles, a very hot fomentation, either of plain water or of a decoction of poppy-heads, is most likely to confer relief ; should it not, rub a stimulating application or even a blister upon the parts. By the judicious use of one or other or all of these remedies, I should imagine there would be little doubt about ultimate success in any ordinary case : in dismissing the patient as "cured," however, it will become our duty to warn the proprietor of the possibility or probability of a relapse. Still, in the end, all will most likely do well ; unless we should have the ill fortune to encounter such an extraordinary case as occurred to M. Prevost, wherein a mare was for two years regularly seized every month or six weeks with cramp ; for which at last, her owner was compelled to get rid of her.

SECTION XVII.

DISEASES OF THE EYES AND THEIR
APPENDAGES.

CONJUNCTIVAL OPHTHALMIA	{ CATARRHAL. SYMPATHETIC. TRAUMATIC.
OPACITY OF THE CORNEA.	
PERIODIC OPHTHALMIA.	
CATARACT.	
GLAUCOMA.	
AMAUROSIS.	
WORM IN THE EYE.	

FUNGUS HÆMATODES. OSSIFICATION.

LACERATION OF THE EYELID. ENLARGEMENT OF THE LACHRY- MAL CARUNCLE. FISTULA OF THE EYE-PIT. FISTULA LACHRYMALIS. FUNGUS OF THE ORBIT.

PROFESSOR COLEMAN was in the habit of saying in his lectures, that, according to the accounts of some writers* on ophthalmic medicine, the diseases of the human eye amounted to more in number than the diseases of the whole body of the horse, reckoned altogether; a remark which by no means holds good in the present state of the sciences, and for two reasons: firstly, because the diseases of the human eye have been found to be greatly overrated; secondly, because those the horse is obnoxious to have been greatly underrated. While the writers on human ophthalmic medicine of the Professor's day amplified and multiplied a great deal too much, the Professor himself simplified and abridged a great deal more than subsequent observation and experience have been found to warrant; in proof of which, we need but set the account given of the diseases of the horse in the Professor's lectures against the list enlarged by those diseases since brought to light in the various modern veterinary works, and, above all others, in the pages of *The Veterinarian*.

Perhaps no department of human pathology has sustained greater cultivation and improvement than the ophthalmic. Diseases of the human eye, numerous as they are when compared with those of the generality of other individual organs,

* In allusion, perhaps, to a work by Dr. Rowley, to which he gave the title of 'A Description of 118 of the *principal* Diseases of the Human Eye.'

and intense and rapid in their progress as some of them are, are most of them, at the present day, treated with an expertness and a success which reflects the highest honours on medical science, and on those who practise it. Veterinary surgery has likewise undergone considerable amelioration since the days when the projecting haw was cut out for the cure of ophthalmia. Indeed, veterinary surgeons might be expected to avail themselves of the advancement made in this department of art by the human oculist, and to every allowable extent they appear to have done so; but, unfortunately, that extent has its limits. Owing to dissimilarities of structure and function, and consequent differences in pathology between the eyes of man and horse, and to certain disagreements in the constitutions of the two animal bodies, we are on too many occasions precluded from using the same means, or at least from deriving the same benefit from their use, as are with so much justice extolled by human surgeons. To furnish one example of this: one of the commonest causes of blindness, both in men and horses, is *cataract*. This the surgeon is no more able to cure, by medicine, than we are; but he has it in his power to remove the cataract by an operation; he either *extracts* the opaque body, or *couches* it out of the axis of vision, and so far relieves and satisfies his patient. But the veterinarian has it not in his power to afford his patient any such relief. When he attempts the operation of extracting or displacing the cataract, the retractor muscle and membrana nictitans—parts not present in the human eye—oppose and foil him in his endeavours; and, even supposing he were to succeed in the operation, still difficulties present themselves beyond his art or power to overcome. No man from whose eyes cataracts have been removed can see afterwards without glasses to supply the deficiency of the lost lenses; but, could horses wear spectacles? And, even if they could, how are we to discover what refracting powers in the glasses the animal requires; for no two persons hardly are alike in this respect? Or, how should we like to ride or to drive horses dependent for their vision upon some contrivance in the form of spectacles? I remember a person, many years ago, offering to the notice of the Board of Ordnance an artificial eye for a horse; but I have no knowledge of ever having

witnessed any attempts at adapting eye-glasses to animals; though the one experiment appears to be about as feasible or as ridiculous as the other.

There is yet another manifest disadvantage the veterinarian labours under in his ophthalmic practice, one that used to be urged by Professor Coleman—who devoted his mind a good deal to the subject of the eye—and that is, supposing a man to have disease or defect in his eye, and a surgeon only so far remedies it as to give him imperfect vision, or vision through the aid of glasses, his patient is thankful, and departs in a measure satisfied; but unless the veterinary surgeon be able to restore completely, or nearly so, the eyesight of his patient, he has very likely rendered the horse worse fitted for his work than if he had destroyed vision altogether; it being a notorious fact that a horse that shies through imperfection of sight is a more dangerous servant than one totally blind.

Although the catalogue of diseases of horses' eyes, framed according to our present knowledge of them, is certainly, contrasted with the surgeon's list, a contracted one, yet is there disease, or one class of diseases, which exerts terrible havoc on our patients, and over which, unfortunately, we possess less control than perhaps any other disease, taking the range of every other part of the body. The diseased action, whatever be its nature and cause, appears to be one peculiar to the horse species;* man's eye is affected by nothing like it, nor, that I am aware, is the eye of any other animal; consequently, it becomes confined to the practice of the veterinarian, and from him alone can receive that exposition which its importance demands, and its destructive tendency renders so desirable.

In textures so different in nature and variously organized as those composing the eye, inflammation naturally becomes modified in its character, course, and consequences; in the con-

* It is a mistake to suppose that the disease is never seen in the eyes of mules and asses. While I was in the Peninsula, serving in the Artillery, I found mules *especially* subject to malignant diseases—to farcy, and glanders, and grease, and ophthalmia (and to mange)—which were evidently bred in the filthy confined sheds they stood crowded together in. In fact, both mules and asses I believe to be much *softer*-constituted, and therefore more susceptible animals than horses.

junctive membrane we become apprised of its presence through the ordinary indications of redness and swelling, increased heat, and evident pain ; whereas, in the internal parts of the eye, too often does it escape our observation until actual effusion or change of structure has taken place. So long as it is confined to the conjunctiva, we have no reason to believe that it anywise differs from inflammation in other parts of the body ; but, no sooner has it implicated parts composing the eyeball itself, than the same remedies no longer exert the same influence over it. This circumstance has given rise to a distinction of inflammations affecting the eye into that which is *common* or *simple* in its nature, and that which is *uncommon* or *specific* in its character ; in other words, into that kind which we profess to understand, and that which, from the little power we possess over it, we may fairly be said not to comprehend. It is true that causation has much to do with the kind of inflammation that follows ; that peculiarity in the excitant appears an essential part of the specific nature of the disease ; but, at the same time, it is evident only certain parts can become the nidus for such specific inflammation ; we never see it *confining* its ravages to the conjunctiva, although that membrane is in every case, in the acute stages of the disease, more or less affected.

Inflammation seizes the conjunctive membrane, primarily or exclusively, from one of two kinds of causes ; either from changes of temperature, or such influences as give rise to inflammation in other mucous membranes, producing catarrhal affections ; or from injury of some kind ; and thus arises in the horse the disease called

CONJUNCTIVAL OPHTHALMIA.

The anterior hemisphere of the globe of the eye, indeed every tangible part of it, is covered by *membrana conjunctiva* ; and the same membrane, by reflection, becomes the linings of the upper and under eyelids, as well as the covering of the fore part of the *membrana nictitans*. From a common resemblance in structure and economy, from the same kind of exposure, and from susceptibility to the operation of similar causes, the conjunctiva,

often simultaneously with the membrane of the nose, takes on inflammation. When a horse has a catarrhal affection, what is more common than to perceive at the same time that his eyes are weak, and are pouring forth mucous or even purulent matter from their inner canthi, and, perhaps, over the borders of the lower eyelids as well? The animal has evidently got "a cold in his eyes," as well as one in his nose and throat; in proof whereof, inversion of the lids will show the conjunctive membrane reddened, more or less tumid, and injected. Indeed, in most inflammatory affections of the air-passages and lungs, in encephalic inflammations, and in dental irritations, we shall find the conjunctiva more or less participating in the increased action; and so much attention did former practitioners of horse medicine pay to the state of this membrane, and such importance attach to it, that it constituted, in constitutional diseases, their guide, their sole guide very often, in respect to the expediency of bloodletting, and the quantity of blood they ought to take away; nor is the indication totally disregarded by many very good practitioners among veterinary surgeons. Such conjunctival inflammation, however, can be regarded but as *sympathetic* in its origin and nature, increasing and subsiding with the main disease present in the system; to the latter, consequently, we devote our undivided attention, heeding the former but in the light of a thermometer, or guide to a certain extent in our therapeutic proceedings.

I have, however, met with idiopathic conjunctival inflammation. I have known horses turned into straw-yards at certain seasons of the year, during the prevalence of cold drying winds, exhibit most unequivocal symptoms of this disease, unaccompanied even with any catarrhal disorder. I acknowledge, however, that such cases are rare; and that the *ordinary* cause of this inflammation is injury of some sort. It is far from being an easy matter to answer the question, why horses' eyes should not be subject to the various conjunctival diseases which affect our own; certainly, the conjunctival parts of horses' eyes are not so exposed as those of our own are; nor are horses' eyes obnoxious to the contagions which ours are; neither are they liable to any disorder through derangements of the digestive organs, at least, if we except the liver. None of these differences,

however, nor indeed all of them together, seem to account for the peculiar exemptions the eyes of animals enjoy in this respect.

The TRAUMATIC is the form of conjunctival ophthalmia which we are mostly called to treat as a special disease. The horse is brought to us with his eyelids closed and knitted together, occasioned by the irritation excited by the presence of the offending body, whatever it may be. The moment we attempt to separate them, the lids are more forcibly contracted than ever; and no sooner have we effected any separation, than a gush of hot tears collected within them meets our fingers, while against them is simultaneously thrust the membrana nictitans. The conjunctiva, disclosed by the eversion of the upper lid, appears intensely reddened and tumid from infiltration; perhaps besmeared with mucous or purulent secretion. The eye itself has a small sunken aspect, in consequence of being retracted, at the time of our examination, into the orbit; the cornea appearing the while even brighter than usual, from the profuse flow of tears over it.

THE CAUSE of all this irritation and inflammation must be sought for while the eye is in our power. We must first, to the extent we are able, separate the lids, so as to obtain a view of the cornea, to ascertain if that be the part injured; a blow from a whip or switch, or a bite from another horse, the lesion commonly met with, leaves a wound with some detachment of substance hanging from it, which will now become apparent. Should there be no injury to the cornea, the probability is that some foreign body, a hay-seed most likely, though it may be something else, grit or dirt perhaps, has got lodged underneath the upper eyelid, the eversion* of which, to the extent we are able to accomplish such an operation, becomes necessary to enable us to remove it. If the hay-seed or whatever it may turn out to be, had not got hitched or fixed in the membrane, the flow of tears which immediately followed its introduction would have been certain to have washed it away, aided, as the ablution always is, by the detersive operation of the membrana nictitans.

* In a man's eye the superior lid is capable of complete eversion: indeed, by means of a probe, is easily turned inside out, and will then remain so until reflected: but so unsubstantial and membraniform are the tarsal cartilages of the eyelids of horses, that we are only able to evert the upper lid partially; nor will it remain everted, unless forcibly retained by the finger.

On this account no foreign body could possibly remain upon the cornea, nor within the shallow channel of the under eyelid : nowhere, in fact, but fixed underneath the upper lid.

The offending substance extracted, the case may be said to have received its remedy ; at least, only such additional or after-treatment will be required as is calculated to allay and remove the effects of irritation. It seldom happens that any abstraction of blood is required. Cathartic medicine may be called for ; or common enemæ may suffice. Poppy fomentation to the eye will be found most availing in the first instance : should any weakness or opacity of the eye itself remain, astringent or stimulant collyria may be demanded.

OPACITY OF THE CORNEA.

There are two kinds of opacities : one is the result of injury to the cornea ; the other of disease. A horse gets a lash in the eye from a whip, or a blow from a stick, or a bite from another horse ; the result is a small wound of the cornea, penetrating through its outer lamellæ, a little flap of which is commonly to be seen hanging from the wounded part. The pain immediately consequent on the injury creates a good deal of irritation, indicated by closing the eyelids and lachrymation ; and this is followed by conjunctival inflammation, the termination of which is opacity of the cornea at the part wounded, and also for a considerable space around it, assuming after a time the appearance of a white or fleecy cloud ; and this appearance is so characteristic of the nature of the case, that see it in what stage we may, we need no one to tell us how it has occurred. Now and then the entire cornea will become *nebulous*, as it is termed, from an injury of this sort.

The same thing may also happen from an injury to another part of the ocular apparatus, occasioning violent conjunctival and ophthalmic inflammation. I once had occasion to perform, as I shall hereafter give an account of, an operation simply on the lachrymal caruncle, and the consequence was violent conjunctival inflammation and ophthalmia, and thick and complete

nebulosity of the entire cornea. When *nebula*, from the changes which in the course of time (unless it become at once absorbed) it gradually undergoes, turns from a hazy cloudiness to a pearly or fleecy whiteness, it takes the technical appellation of *albugo*.

The opacity we have been speaking of arises from the deposition of lymph between the conjunctival covering and the cornea, unless the wound may happen to have been deep, and then probably, in its immediate vicinity, interstitial deposit within the lamellated substance of the cornea has taken place as well. When the cornea becomes obscured in consequence of ophthalmia, it is probable that the chief effusion is seated inwardly, between its lining membrane and lamellæ, and that serous or other effusion has taken place likewise between the lamellæ themselves.

The REMOVAL OF OPACITY will, in general, take place with the dispersion or cure of that which gave rise to it, or will commonly soon follow that result. With the inflammation arising from injury commences and grows the opacity, and with its decline the opacity begins to decrease; and though it may remain some time after all the inflammation has disappeared, yet in the end will it, generally without assistance, become absorbed. Should there, however, be any sluggishness of the absorbent powers apparent, from the disposition of the opacity to remain unaltered either in colour or dimensions, we may set these powers in fresh action often by the use of stimulating powders, ointments, or solutions, and, in some obstinate cases, may derive a good deal of benefit from the application even of caustic substances. Chloride of soda and common glass finely powdered are often used with benefit under such circumstances: but the best application is a solution of nitrate of silver, from ten grains to a drachm even to the ounce of distilled water: indeed, in some instances, good has been done by touching the opacity with the pencil of nitrate of silver. From five grains to a scruple of bichloride of mercury to the ounce of water is another form of injection.

PERIODIC OPHTHALMIA.

With some such feelings of dissatisfaction as must occupy the mind of a geographer about to enter on the description of a country into the heart of which no traveller has been enabled to penetrate, may we be expected to set about the description of a disease whose nature and cure yet remain to be developed. It would be asserting too much to say, we do not understand more about it than former practitioners in horse-medicine did : science has shed its lights upon and much improved our knowledge of diseases of the eyes, as well as those of other organs ; but all art and practice have failed in furnishing us with anything in the shape of remedy, by which we are able either to arrest this one in its destructive course, or prevent its almost sure return and fatal termination ; and therefore, in point of naked fact, what we profess to have learnt concerning the nature of periodic ophthalmia has turned out of very little practical use to us. Still, it is our duty to record what we do know, to lay down such rules for the guidance of future inquirers as former investigators and our own experience have put us in possession of ; and with such views as these, rather than with any prospect of proving of much benefit to our suffering patients, do we enter on the consideration of the subject before us.

D'Arboval pronounces this disease, "de toutes les maladies, qui affectent les yeux du cheval, la plus commune, la plus grave, la plus opiniâtre, la plus rebelle, la plus fatale." Had he said which affect *the horse*, instead of *the eyes* of the horse, he would still not have gone very wide of the truth. This indeed is, as has been said of some other disease, "the bane of good horse-flesh." What can be more annoying to the feelings of a horseman, than to be told that what he took to be simply "a weak eye" or nothing more than "a cold in the eye," is likely, nay almost sure, to prove in the end the cause of blindness ; and that, as it is not in the power of his medical adviser to prevent this sad termination, he had better avail himself of the first opportunity to dispose of his horse, to part with him whom for so many good qualities he has set inestimable value upon, or

about whom many fond expectations had been raised which now are all to be blasted in the bud. Such advice as this is enough to make a man exclaim in the doctor's face,

“ Throw physic to the dogs,—I'll none of it !”

NAME.—Among the various appellations given to this disease, we have preferred the one which denotes its peculiarly characteristic or most remarkable property, its *intermittent* or rather *periodical* character ; for it is not by fits or paroxysms, after the manner of an ague, that it returns ; but by relapses, as though it were a fresh disease, after having been absent for more or less considerable time. On this account, I prefer the epithet “ periodic ;” the same which the French veterinarians have adopted. Professor Coleman called it “ *specific ophthalmia* ;” signifying that it was a disease differing from common inflammation of the eye, or that it was one *sui generis* : but the same epithet, “ specific,” being applicable to glanders, to farcy, to grease, and some other disorders, seems on that account less characteristic than the one I have chosen. The earliest authors on farriery called the disease “ moon-blindness,” an appellation modernized by some succeeding writers into “ lunatic blindness ;” they entertaining a supposition that, “ as the moon changed, the horse gradually recovered his sight.” Old Gervaise Markham, in his ‘ *Masterpiece*,’ has the following passage : “ Now they be called *moon-eyes*,” showing the appellation did not originate even with him, “ because, if the farrier do observe them, he shall perceive that at some times of the moon the horse will see very prettily, and at some times of the moon he will see nothing at all. Now the signs thereof are, when the horse's eyes are at the best, they will look rather yellowish and dimme ; and when they are at the worst, they will look red, fiery, and angry.” Mr. Fearon named the disorder “ gouty ophthalmia,” from the resemblance Professor Coleman, in his lectures, was wont to draw between its periodical returns and the paroxysms of gout. Mr. Sewell proposes to call it “ odontalgic ophthalmia,” from an opinion which, as we shall see hereafter, he has imbibed from some continental veterinarians, who have assumed that its attack is influenced or produced by

dental irritation. Mr. Spooner has suggested the name "hereditary ophthalmia." Mr. Croxford, a student at the time, pertinently asks why it may not be called "*constitutional ophthalmia*."

The SYMPTOMS, together with the little history attached to them, are in general sufficient to mark the presence of this disease. From its commonly making its attack during the night, the groom discovers, on entering his stable in the morning, that his horse has got "a weak eye;" which, in reporting either to his master or to the veterinary attendant called in, he seldom fails to attribute to "a blow" or "bite" accidentally inflicted some time in the night, or else to "something having got into the eye:" and, indeed, the half-closed aspect of the eye itself very much favours this fallacy of the groom's.

The upper lid droops upon the cornea to shut out the glare of light. Tears are produced in that abundance that they cannot be carried away by the puncta lachrymalia, and are consequently overflowing their natural boundary, the lower eyelid, and streaming down upon the face. Both eyelids, together with the venous vessels in the immediate vicinity of the eye, are tumid or fuller than ordinarily. What little is visible of the globe of the eye appears dull and sunken. The organ is intolerant of light; and especially evinces this when suddenly confronted with the strong rays emitted through the door or window of the stable, by momentary nictitation, and by recoil within the orbit and simultaneous protrusion of the haw. Seizure of the upper lid by its lashes, and attempts to evert it, cause the ejection of the haw,* and affords us an enlarged view of the *membrana conjunctiva*, reddened and injected through inflammation, commonly of the sub-acute character, and more or less tumid from infiltration. The circumference of the cornea sometimes exhibits a broad nebulous circle, being an

* When the object is to inspect the interior of the eye, the intrusion of this troublesome visitor is best guarded against by opposing the bulbous end of a large probe against it. Without such compulsory means, however, a sufficient view of the eye is often obtainable—before any disturbance has been given to it—by turning the horse's head in a situation where the light is subdued, and yet enough for the purposes of inspection.

extension of that which, in human medicine, is called the *arcus senilis*.*

At the beginning, the anterior chamber of the eye commonly preserves its pellucidity, so that we distinctly view the iris and pupil through it, the latter much contracted, the former unchanged in colour ; but in the course of two or three or four days afterwards—sometimes indeed on the very day of the attack—the chamber becomes obscured by a dingy white or amber-coloured deposit seen floating within it, through which the pupil is hardly distinguishable, contracted as it is to the breadth of a broad line, and looking more like the black eye of a garden-bean, than the ovoid aperture it was before. Supervening upon this, in some cases concomitant with it, we have obscuration of the cornea taking place, arising from an extension of the conjunctival inflammation over it; and this in very severe cases, is so intense that vessels carrying red blood are perceptible upon its surface, shooting from all sides of the circumference into a sort of *circulus vasculosus*, from which others proceed, after the manner of *radii*, towards a common centre. The obscuration of the cornea, though it may still leave the lymph effused into the chamber of the eye visible, precludes us from distinguishing the pupil and iris ; and it is not until the inflammatory action has abated that we regain a view of these parts. And this constitutes the *first*, or *inflammatory stage* of the ophthalmia, which, generally, may be said to last from three to eight, nine, or ten days, and longer according to the intensity of the inflammation, as it happens to be a primary or secondary attack, and to the condition and situation of the horse at the time ; in some measure, also its duration will be influenced by what happens to be done by way of treatment.

The SECOND STAGE is marked by a gradual decline of the inflammation, and, along with it, a tardy clearing of the cornea,

* It is natural to the horse's eye to have a whitish border encircling the cornea ; but in health this is narrow and well defined ; whereas occasionally under disease it will be found to have broadened considerably. " We owe to Dr. Ammon the interesting observation that, in those eyes—in human beings—where there is an *arcus senilis* of the cornea, a similar opaque ring exists around the margin of the crystalline body."—*Mackenzie on the Diseases of the (Human) Eye*.—Is this the case in horses under disease ?

sufficient at least to enable us once more to see the parts within. Through the anterior chamber, murky and darkened, we indistinctly descry the iris, altered in colour and lustreless, with the pupil contracted perhaps as much as ever, but now not evincing that sensitive intolerance of light which it did in the inflammatory stage; and therefore it is that the horse, when left to himself, opens his eyes wider than he did before, particularly while standing in his stall, with his head turned away from the glare of light. Within the chamber, gravitating to the bottom of it, are to be perceived flakes or flocculi of whitish or yellowish lymph, effusions, as we suppose, from the vessels which secrete the aqueous humour. There is no longer an overflow of tears upon the face, or nothing like to the extent there was; nor does the conjunctive membrane any longer exhibit the same redness and tumidity it did at the beginning. In a word the inflammatory action is passing away, little more than its consequences now remaining; and from this time, day by day, the eye appears recovering from the attack.

REMISSION.—I repeat *appears* recovering, when, in too many instances, on the second, third, or fourth day afterwards, we find it almost closed again, light being as annoying to it as ever, fresh tears running over the face, and obscuration once more clouding the cornea; in a word, there is an evident remission of the symptoms, leading us to believe the treatment adopted—whatever it may have been—has been productive rather of harm than good. Two or three or four days more elapsing, and the inflammatory symptoms are evidently once more on the decline; the eye appears in the convalescent condition it was before the remission, and henceforth all inflammation and irritability will quickly subside: the absorption of the matters effused into the substance of the cornea, and into the chamber, and the consequent return of transparency to these parts, following as natural consequences. The brightening of the chamber may be observed to take place from above downward: but as for the clearing of the cornea, that proceeds so imperceptibly that it is difficult to say whether the process begins and ends in any particular locality.

SOME FEBRILE DISORDER, during the accession and continuance of the inflammatory paroxysm, is discoverable in the

system: although to the common observer, the animal, from eating and drinking with his usual appetite, may perhaps appear undisturbed in health, the professional man detects a sharp febrile pulsation, and a mouth hotter than natural; the tongue drier: the bowels somewhat costive; the urine less and higher coloured, and at his work—at which the horse is frequently continued, notwithstanding his ophthalmia—he is found to be weak, and to sweat under less exertion. And yet the animal, as I said before, evinces no very evident sign of feeling unwell; or none, at least, that seems to be heeded by his groom or master, whose attention is wholly engrossed by the “weak” eye. D’Arboval has remarked, that when one eye by itself is affected, the pulse on that side is harder and fuller than on the side of the healthy eye.

THE DURATION OF A PAROXYSM OF OPHTHALMIA will be found to vary very considerably. First attacks, and commonly second and even third attacks, will occupy a period of from ten days to a fortnight: I knew them, in two instances, to extend to a term of forty-one days. But when the disease comes to relapse frequently, and run from one eye to the other, the paroxysm will now and then prove extremely short: in three or four or five, sometimes even in two days after setting in, all will be over again; and in these fugacious visitings, of course, there is nothing like remission observable.

VARIETIES of this ophthalmia are distinguishable. Sometimes it assumes an acute, nay, even a virulent form; oftenest, however, the sub-acute character. In cold and wet seasons I have seen the disease endemic, attacking horses in certain exposed situations. It is certainly neither infectious nor contagious; nor have I myself ever known it prevalent enough to be called an epidemic.

THE PROGRESS, irregular, interrupted, destructive though it may be called, yet cannot, in the generality of cases, be said to be rapid: on the contrary, the inflammation, as I have just observed, is commonly of the sub-acute type, with that Protean phasis which one day holds forth the

“Promise to our *sight* to break it in our hope.”

Cases, however, do every now and then occur, rare though

they be, in which the inflammation is of that unequivocal and violent character that pursues its course with rapidity, and in spite of everything in the shape of obstacle or remedy we may attempt to oppose it with, and in the course of a single paroxysm, effects the total destruction of the visual organ.

The INTERMISSION is ushered in by a disappearance of all signs of inflammation, and a clearing up of the obscured parts of the eye, with a more or less complete restoration of such of them as may have undergone any change in their aspect, to their former colour and texture. For a considerable time, however, even after a first attack may be remarked, on closely inspecting the eye that has suffered, more than usual pendulosity of the upper lid, a somewhat prominent haw, an appearance of gloom and sunkennes about the globe of the eye, with evident irritability and unusual contraction of the pupil when the eye is faced to the light: and fortunate altogether may it be considered for the animal should no more than these slight imperfections remain, since, in time, providing no fresh attack intervene, they may all be expected to disappear, and the organ in the end to recover its wonted aspect and powers. So long, however, as these sequelæ do continue to exist, and particularly so long as there remains any turbidness of parts which ought to be transparent, the horse will be found to have acquired an air of apprehension and suspicion not at all natural to him: he will be techy when anything is done to his head, and especially when it is handled on the side of his affected eye; and this will subside only on the return to health of the eye itself. And fortunate would it be for the animal if this return to healthfulness could be reckoned upon as permanent: alas! the account we feel ourselves in duty bound to give his master is, that, after an intermission varying from one to several months in duration he may expect a relapse of the same disease, and in the other eye probably. I have noted, after primary attacks, intermissions of three weeks, six weeks, and three months; and in one case the disease did not return until the seventeenth month: it has, however, relapsed in almost all the intervening periods.

BUT ONE EYE at a time, generally speaking, is attacked. I have seen instances of both eyes suffering simultaneously; but

I find, on reckoning my cases, that they bear a proportion of no more than six to fifty, or of one in eight or nine. Not, however, that the healthy eye escapes : on the contrary, after the cessation of the paroxysm in one eye—unless the first attack should have proved violent enough to destroy that eye, which is but rare—the opposite eye will most likely receive the succeeding attack : though sometimes the disease relapses in the same eye. This propensity to attack the eyes alternately, has raised a question among veterinarians, whether it arise from the known sympathy existing between the visual organs or be the offspring of the same predisposition and excitement which produced the disease in the eye first invaded. The rapid and complete destruction of the diseased eye being found to be an omen of security to the sound one, has appeared to favour the notion of sympathy being the influential agent ; and on such a supposition it has been proposed, as an expedient for saving one eye, to put out by artificial means that which was in a state of disease. Supposing there existed any good grounds for putting faith in this theory of *sympathy*, there might be some reason or excuse for a practice revolting in itself to our best feelings : as, however, this cannot be shown to be the case, but, on the contrary, the attack on the other eye appearing to be no more than we might expect from the admitted constitutional nature of the disease, this desperate operation has met with no supporters.

RELAPSES are looked for as a matter of course. There are instances of horses being fortunate enough to have experienced but one attack, and that not of a destructive character ; and, as I already stated, cases have occurred in which a single attack has deprived the organ of vision : these, however, are both exceptions to the general rule of progress. Ordinarily, the disease, after attacking one eye, relapses in the other, and continues this alternation until the animal is rendered totally blind by its ravages, the work of destruction being, as I observed before, commonly effected, as it were, by instalments. It is not the violence of the disease that we have to dread so much as these vexatious relapses. The eye is enabled, perhaps, with the veterinarian's aid, to "weather the storm," and come tolerably clear out of the attack ; hardly, however, has it

regained its usual lustre, and is beginning to be useful to the animal again, when a fresh invasion of the disease involves either it or its fellow in all the danger out of which it has but just escaped, every succeeding relapse leaving the organ in a more deteriorated condition. It may commence in both eyes, and relapse in one; or begin in one, and relapse in both; this last case, however, I believe to be the rarest. And it is surprising how many returns of the disease some horses will experience before the eyes become disorganized; for that alone appears to put an end to relapses: there is a horse at present in my regiment, who has had fifteen attacks in his eyes, alternately, and still, from preserving some vision, is doing his duty; another has had seven attacks in the same eye; two others have experienced, each of them, five attacks, and have gone quite blind. It has been said, that as soon as cataract is completely formed, relapses cease. This, however, is not always the case. The disease will often re-appear, again and again, even after the pupil is completely opaque. In fine, as I said before, nothing short of the disorganization of the entire globe of the eye appears to put an end to its merciless visitations: so long as any structure is left for it to prey upon, so long may the devouring malady be expected to return.

THE CHANGES OF STRUCTURE THE DISEASED EYE UNDERGOES are, with few exceptions, the results of successive attacks of inflammation, and in general require some considerable time for their completion; and when once such changes are commenced, it is a rare circumstance for the disease not to return at intervals, until the eye has, for every purpose of vision, become a total wreck. A first attack, mild in its character and not of long duration, may leave the eye altered only in such respects as in the course of a long intermission may be rectified: deposits in the chamber will be removed; effusions into the substance of the cornea and iris in time become absorbed, the former regaining its original pellucidity, the latter its usual colour and contractility. Commonly, however, after a second paroxysm, and occasionally indeed after a first, there will remain more or less haziness of the cornea, through which we indistinctly perceive the iris lustreless and murky in its aspect, with the pupil contracted, and without any of its

natural bright blue to be seen. The corpora nigra also appear more pendulous than usual, wanting their jetty blackness, and on occasions exhibiting light specks of opacity. Every subsequent attack will add to these changes of structure. The cornea will, from interstitial deposit and thickening of substance, become opacous to that degree that the internal parts are with difficulty distinguishable through it; within, all appears darkened and gloomy, altered in colour and texture; in which state things remain, probably, until a fresh attack supervenes and for a time renders matters even worse than they were before: ultimately, however, with the decline of the inflammation, comes the clearing away of this murky cloud, and once more the iris and pupil become distinctly visible, but no longer in the condition we last saw them, the iris being now changed into a dark dead-looking substance, and the pupil, instead of being contracted, being dilated, and assuming that glassy, greenish, yellow cast, which every experienced veterinarian but too well knows is the sure omen of cataract.

CATARACT, forming in the manner it commonly does after ophthalmia, not from a single central or focal point, but by means of whitish or greyish lines radiating throughout the substance of the lens, puts an end to all useful vision, or so confuses it until perfectly formed, that the little sight remaining is, perhaps, worse than none. Inflammation returning—for, as I observed before, completed cataract even will not always prove a bar to relapse—in the end there will be either obliteration of the pupil, through adhesion of its borders to the capsule of the cataractous lens, or else subsequent dislocation of that body, through disruption of the iris into the anterior chamber, where it is seen lying in contact with the cornea, to which it subsequently contracts adhesion. This total disorganization of the globe of the eye is, in after years, followed by a process of internal absorption, the effects of which become manifest in the shrinking and retirement of the eyeball within its socket, and in the ultimate wasting and atrophy of it.

THE DISSECTION OF MORBID EYES, according to D'Arboval's observations, shows an absence of any distinct chamber containing aqueous humour; nothing, in fact, but a single cavity remaining. Sometimes the iris appears lacerated, detached

from the lens, reduced to a very small volume ; its capsule only remaining perhaps, thickened and opaque. At other times the lens is of its natural size, its capsule being opaque, with some white spots in its substance, and concretions upon its inner surface. The posterior portion of the chrystalline is thickened and indurated, almost as if it had been boiled ; and it reflects a bottle-green colour. The fibres of the iris, surrounding the lens, on some occasions become osseous ; and in the place of the vitreous humour, resulting from its decomposition, we find a viscous orange-coloured fluid, heavier than water. Instead of the retina there is a fibrous membrane behind the chrystalline. The optic nerve is flabby and softened.

Mr. Charles Percivall has in his museum a couple of extremely interesting preparations of morbid eyes. In one, the substance of the retina appears in places converted into osseous matter, constituting what may be called *ossification of the retina*. In the other, the nervous expansion was wanting : it seemed to be a case of *absorption of the retina*.

Mr. Cartwright had a good opportunity afforded him of ascertaining the state of an eye that had experienced "three or four attacks of ophthalmia ;" and contrasting it with the other eye, which was sound.

"The vitreous humour had not that beautifully white glassy appearance that it has in its sound state, but was of a very pale amber colour, having a slight tinge of green in it. The lens and capsule were as near as possible of a natural colour and transparency ; but they certainly had the same light amber tinge as the vitreous humour. The under surface of the pigmentum nigrum (the choroid coat) was highly inflamed ; for, on scraping the anterior surface off, it presented a scarlet appearance, evidently referable to an immense number of small vessels ; on cutting which across they evidently emptied themselves, the redness in a great measure vanishing. This was so evident, that, after forcing the vitreous humour out, the parts were of a dark red colour when seen through the anterior part of the pigmentum nigrum. This redness was not situated on or under any part that is called *tapetum lucidum*. The optic nerve was decidedly harder to cut through than that of another eye, and was more dense in its texture."—*Veterinarian* for 1836.

M. Rodet has published the results of the dissection of a horse who had experienced several attacks of ophthalmia in both eyes, and who at length was destroyed in the time of an intermission, on account of having contracted glanders. The cerebral substance throughout was injected ; the optic thalami and nerves equally so, with such an extraordinary development of their blood-vessels that they looked as if they were varicosed. Although the animal had been bled to death, the sclerotic vessels still were so distended, that when cut, blood in abundance flowed from them. The adherence between the choroid and sclerotica was greater than usual : and

both tunics exhibited ecchymoses. The vitreous humour assumed a deep citrine colour; and although as limpid and diffuent as in health, was mingled with striated obscurities which, separated, proved to be networks of capillary vessels, red and injected, and in an inflammatory condition. As yet the chrystalline had undergone only a slight augmentation of density, with little diminution of its transparency. But the membrane lining the chambers, which contains the aqueous humour, was inflamed to that degree that it exhibited a determined vermilion tint, and its vessels, which were disposed like lace-work, were most conspicuous. A magnifying glass discovered, in all the internal structures, and especially in the lens and its capsule, multitudes of injected capillaries, which, with the naked eye, would have been invisible. What, as M. Rodet remarks, is well worthy of note in this case is, that at the time the animal was destroyed, which was during intermission from ophthalmia, the eyes, which were of their natural colour, showed nothing beyond some slight general obscuration, such as the state the vitreous humour exhibited might naturally be supposed to have produced.

DIAGNOSIS.—Although there is no likelihood of a well-marked case of periodic ophthalmia being mistaken for one of simple conjunctival inflammation, yet do, now and then, cases occur which for a time create a doubt in the mind concerning their true nature. Should there be discoverable any mark of a bite, or a blow, anything be found to have worked its way underneath the lid or even any catarrhal signs, any mucous or purulent secretion from the conjunctiva, the case will be evident enough. But we must not set down every case which is not so distinguished as periodic; for though, as far as treatment is concerned, we can do no great harm be the case which it may, we may thereby mislead both our employers and ourselves in respect to the event. If we will but wait a little—not in treating the case, but in pronouncing any decided opinion upon it—symptoms already existing will give way, or fresh ones will declare themselves, and thus all doubt will be dissipated. In simple ophthalmia—unless the cornea itself receive injury—rarely will the interior of the eye disclose any other alteration than some irritability and consequent contraction of the pupil: whereas, should it be the specific disease, soon there will appear either some dulness or mistiness of the cornea, some effusion into the chamber, or muddiness of the aqueous humour, or else some loss of colour or brightness in the iris, symptoms which but too surely betray its presence. Should it happen—

which is not at all likely—that doubt about the nature of the case be prolonged even beyond the first attack, the supervention of another similar paroxysm will settle the point at once.

GELDINGS MORE SUBJECT THAN MARES TO OPHTHALMIA.—Of the fifty cases of troop-horses recorded in my own practice, thirty-nine have occurred in geldings, eleven only in mares. How is this? D'Arboval, who has chronicled the same fact, accounts for it on the supposition that there is a connection between *dentism* and ophthalmia. He thinks that the greater irritation occasioned by the cutting of the tusks than of the other teeth, renders geldings more subject to the disease. That, so far as irritation is concerned, constitutional even as well as local, the tusks produce more in the course of their eruption than all the other teeth together, I can readily testify; and therefore, if it can be proved—as will be seen when we come to the etiology of the disease—that dentism is a cause of ophthalmia, the reason of the special liability of geldings becomes evident.

THE EYE MOST DISPOSED TO THE DISEASE, according to my own observation, is the small dark-looking one, that which by no chance whatever is seen to disclose any appearance of white. Everybody appears to view *wall-eyes* as all but exempt from ophthalmia. I have not had much to do with wall-eyes myself, and therefore can hardly speak concerning them: but Mr. Castley “remembers two horses in particular, officers' chargers, whose eyes were of that description which is said never to go blind, but which became affected under exactly similar circumstances: one had brown or hazel-coloured eyes, like that of a sheep, the other was a wall-eyed horse; and they were seven or eight years old.” Disease in their eyes supervened on states of debility, consequent on repeated attacks of *diabetes*, or rather *polyuria*. I am informed by Mr. Goodwin, the Queen's Veterinary surgeon, that, so far as the eyes of cream-coloured (Hanoverian) horses are concerned, he has never observed anything peculiar in their diseases.

The CAUSES OF PERIODIC OPHTHALMIA demand the greatest attention from us, both on account of the light which they shed upon the nature of the disease, and of the suggestions they furnish us with for its prevention,

HEREDITARY INFLUENCE, according to some veterinarians, shows itself almost everywhere in the production of ophthalmia ; according to others, its power is of a very ambiguous character. We learn from D'Arboval that most of the French veterinarians believe the disease to be hereditary ; and yet, as he observes, we have in the face of this belief, the facts that foals have issued from ophthalmic parents without inheriting the disease ; while others, whose dams and sires have never had ophthalmia, have themselves contracted it. And, independently of this, it is not evidence altogether satisfactory, to show that such a mare breeds foals, or such a stallion gets foals subject to ophthalmia, unless it be at the same time proved that the young animal has not contracted the disease, or the predisposition to take it, from the *pasture* or *climate* in which he has been reared : since it has been demonstrated that horses in certain situations—in low, wet, marshy pastures—have had ophthalmic disorders break out among them, which have ceased on their removal to upland or dry situations.* This is a fact which equally applies to some other specific or malignant disorders—to glanders and farcy, grease and canker. I feel satisfied, however, myself, that we have sufficient testimony on record to prove periodic ophthalmia to be what is called “an hereditary disease ;” and that, therefore, too much precaution cannot be taken by breeders to steer clear of propagating so irremediable an evil. Granting the influence of hereditariness, our next inquiry is,—

IS IT THE DISEASE ITSELF OR ONLY THE PREDISPOSITION which is transmitted—in other words, can the offspring of ophthalmic parents take the disease without being exposed to certain causes, called by us *excitants* ? If it be answered “yes !” how then comes it that the disease so much confines its attacks to horses of certain ages, and in certain situations ? If, “no !” then the production of the disease under certain conditions and states of excitement can be most satisfactorily accounted for. I, therefore, look upon the here-

* During the winter of 1840-1, which was an intensely cold one, several of our young horses who were in strawyard close to Windsor came up into stables with ophthalmia : for these twenty years I do not remember to have seen so many cases in so short time. The disease was, I should say, in this instance, clearly *endemic*.

ditary influence as predisponent only—not excitant; not sufficient of itself to produce ophthalmia.

IS THIS PREDISPOSITION CONSTITUTIONAL OR LOCAL? In other words, is it something in the blood—some idiosyncrasy which predisposes?—or is the predisposition inherent in the formation or excitability of the eye? These are most interesting questions, of which various facts and observations, current among us, may be brought forward by way of elucidation. “According to my own experience,” says Mr. Castley, in *The Veterinarian* for 1831, “ophthalmia is much more frequent towards the north than in the southern parts of Europe. In Spain and Portugal it is a complaint of rare occurrence, whereas in France and England it prevails to a considerable extent; but certainly, most of all, in Ireland. I feel no hesitation in saying, that there are far more blind and half-blind horses in Ireland than are to be found in any other country, proportionably to its size, in Europe; and I think this is to be accounted for on the score of hereditary predisposition”—owing, in fact to the little or no attention paid to the stock bred from. “A Yorkshire breeder considers it of great consequence to have a sire free from defects and blemishes: but in Ireland, for a stallion to be blind or half-blind, appears to be no detriment to him; and as for the dam, supposing she be blind, the Irish make a point of breeding from her, because (continues Mr. C.) she is fit for nothing else.” Farrier-Major Kemp, who had served with the 10th Hussars in Ireland, informed me that he had observed that *grey* horses appeared most subject to the disease. It is commonly observed among ourselves in England, that what are called “pig-eyed” horses, with large coarse heads, are more liable than others; such horses having at the same time thick skins and fleshy legs, and being soft or mongrel bred—bred, perhaps, in low or fenny and poor pastures; of which stamp are many French and Flemish horses.

PROFESSOR COLEMAN denied all hereditary influence. “I recollect,” says Mr. Castley, in *The Veterinarian* for 1830-31, “when at the Veterinary College, observing to our worthy Professor, Mr. Coleman, that the practical breeders of horses in Yorkshire considered this complaint in a great measure *hereditary*; and for that reason they almost always had great

objection to breeding from either horse or mare that had gone blind : they said, 'it was almost sure to run in the stock.' I was laughed at, I remember, for giving utterance to such a vulgar and obsolete crotchet. I care not," continues Mr. C., "whether this be called hereditary disease or only an original predisposition : it amounts to just the same thing ; and I venture to affirm, that *this is by far the most frequent origin of the periodical ophthalmia in horses.* But while I assert this, I am ready to admit that it also arises from a variety of other causes, quite adventitious and unconnected with this source."

Mr. Spooner, at the Veterinary College, is so warm an advocate for hereditariness, that he proposes to call the disease "hereditary ophthalmia." A gentleman stated to Mr. S. that the stock of a certain stallion had all contracted the disease though the horse himself had never been known to suffer from it.

AS OTHER CAUSES—lunar influence having been abandoned—a variety of agencies have been adduced, and had their supporters. Digestion has been accused of causing it. Marshy pastures, such as generate miasmata, to which the eyes become exposed, are said to produce it ; while other pastures, from their fattening qualities, tend to the same result. Chabert thinks that using horses too young brings it on. Some French veterinarians have referred it to the cutting of the teeth, and the mastication of hard provender at the time ; and upon this Dupuy seems to have founded his opinion, that the disease in the eyes arises from the irritation caused by the compression of the molar teeth upon the fifth pair of nerves ; a circumstance, he informs us, he has proved by anatomy to be peculiar to horses. And, in confirmation of his theory, he adduces the experimental results of section of the fifth nerve, which he finds as regards the eye, to be, obscuration of the cornea, together with inflammation of the conjunctiva, iris, &c., and all the consequences thereof. Here is a strange and unlooked-for result, and a phenomenon altogether that calls for serious consideration on our part. We cannot view it as the chief cause of ophthalmia, because there are facts strongly militating against it : at the same time we would not deny all influence to it.

Professor Sewell, as we learn from the Reports of the Transactions of the Veterinary Medical Association, in *The*

Veterinarian for 1840, inclines to the French opinion: he thinks ophthalmia springs out of the local plethora produced in the head about the fourth year of age by the development of the molar teeth.

Mr. Castley, strongly as he has expressed himself in favour of hereditary causation, has known ophthalmia to supervene on great exertion, on an extraordinary day's work, and on violent exhaustion; he has seen an instance or two of its making its first appearance in states of great debility, and inanition from bloodletting. To this, adds Mr. C., "high-feeding and forcing the animal to breathe an impure atmosphere, are without doubt among the common exciting causes of this complaint." Mr. C. had also noted, in the course of practice, several cases which induced him to believe the disease might spring out of a metastasis, or certain disturbed states of the system. He thought he had seen it occur after long-continued and repeated attacks of diabetes (*polyuria*?).

SUDDEN EXPOSURE TO LIGHT, after having been long confined in dark situations, has been known to induce the disease. Mr. Dunn, V.S., during his apprenticeship, saw several horses, which had been examined previously to descending into coal-pits, and found perfectly sound in their eyes, who, after having been but a short time in the pits, were soon after their emergence attacked with severe ophthalmia, which terminated very rapidly in blindness. This is an observation worth something to us. It is just possible that young horses standing for two or three and twenty out of the four and twenty hours, daily, in dark stables, and on occasions for two or three or more days together, may feel the change in their eyes, when brought out of their dark stalls suddenly into the glare of a meridian sun.

Professor Coleman's opinions on this ophthalmia we learn from his Lectures to be, that the disease is never seen prior to the domestication of the animal; never occurs on a common or in the open air, but is the product of the poison generated from the effluvia of the breath, dung, and urine, of horses standing together. In proof of which, the disease is found to be more or less prevalent, according as the stables in which horses stand are more or less confined or ill-ventilated: where there occur most cases of inflamed lungs, grease, and glanders, there we

find most blindness ; and where these diseases are rarest, ophthalmia is least known. We find farmers' horses going blind, because they are kept in foul, badly ventilated stables ; and the same observation applies to posting establishments, and to such of our country stables as are ill-constructed and undrained. In some horses this poison of the stables will affect one organ ; in other horses some other organ ; or it may affect the whole mass of blood, and afterwards show itself locally in some one or other of these organs. As a proof that this is not a local disease, we often find that the inflammation at first is very trifling : we know nothing about it until we discover it in the transparent cornea, and then even the inflammatory action appears not one tenth part so violent as what would proceed from a blow ; and, yet, in the latter case it would in time subside without any remedy at all being employed, while in the former, all that we can do proves of no avail. The specific ophthalmia makes its appearance, first, in an inflammation of the conjunctiva lining the eye-lids ; then affects the membrane covering the opaque cornea, and very soon afterwards we perceive vessels shooting into the transparent cornea. Horses labouring under this disease either perspire profusely from exercise, or not at all. Seldom are they in a healthy state. In perspiring so freely they evince debility ; in their skins being dry, they show themselves to be out of health.

Coleman's doctrine is shaken, Mr. Castley thought, by the fact, that, in a regiment of cavalry, cases of ophthalmia, greatly more in proportion, occur among troop-horses than among the officers' horses ; notwithstanding the stables in which the former are kept are in accordance with regulations ventilated, and that the latter stand in stables shut up as close as grooms choose to make them. I cannot, however, myself, admit the force of this apparent objection. The officers' horses, generally speaking, are six years old and upwards ; at least there are very few five-years-olds among them ; and none, most likely, of years four or three. Out of fifty cases of ophthalmia occurring in my own regiment, I find eight three-years-olds, thirteen four-years-olds, and five five-years-olds, making above half of the whole number. And when we come to deduct,

which we have a right to do, such cases from the remaining twenty-four, as were *relapses*, we shall find the proportion still greater. Added to which, these horses of officers, may be regarded, most of them, as seasoned subjects, horses who have passed unscathed through the hot atmosphere of the stable, and who have now become inured to it. It is not likely that officers purchase any horses having diseased eyes: the veterinary surgeon, to whom they are commonly shown, takes care to prevent that. So that I really do not see that this fact, for fact and truth it is, operates against the doctrines of our late Professor.

A regiment of Cavalry, although it affords no very large field of observation, yet, under watchful and observant eyes, furnishes facts of a nature that may, to the extent of their bearing, be safely reasoned upon. Strings of horses come from the breeders, through dealers' hands, into regiments; and these horses, prior to admission, are all of them carefully and closely examined by veterinary surgeons; by whom any of them that had defective eyes, or exhibited any signs even denoting they had been the subjects of periodic ophthalmia, would most assuredly be refused. It is therefore fair to conclude that, so far as appearances go, they all enter the service with perfectly sound and healthy eyes. And I may add it is very rare indeed to have occasion to reject one on account of the eyes. In fact, what disease they get in their eyes they contract *after* they come under the observation of the veterinary surgeon. Nor can we deny that there present themselves, in the course of their domestication, causes both for general and local plethora; or that there are times when the stables in which they stand, many of them together, separated only by bails, must be hot and impure too, notwithstanding the precautions taken to ventilate them.

TO WHAT, THEN, IS THE OPHTHALMIA TO BE ATTRIBUTED? The advocate for hereditary influence answers, "to the circumstance of the parents having had it;" while others say, "No!" but to "nervous influence," to "plethora," to "heat," to "a contaminated atmosphere." For my own part, however much hereditariness or other causes may *predispose* the animal to take the disease, I cannot help thinking, and I am led to think

so by observation and experience, that many horses who now contract ophthalmia in stables would escape in situations in the open air; and that in stables we find the proportion of cases less according as the animal *at this trying time of his life*, from his fourth to his fifth year, is moderately fed, moderately worked, and kept in an atmosphere unheated and uncontaminated. I believe that almost anything that will excite commotion in the system at this critical period of age is likely to show itself in the eyes, though not so likely as it is to take effect upon the membrane lining the air-passages. Most young horses, on being stabled, become affected by some catarrhal or bronchitic disorder: some have swelled legs, or fly at the heels; some few get strangles; one, here and there, may evince some diarrhœal affection; others will have periodic ophthalmia; and it is common for attacks of these diseases, in particular of ophthalmia, to come on during the night, at the time when the miasm of the atmosphere of the stable may be supposed to have attained its most concentrated and active form.

IS THE DISEASE LOCAL OR CONSTITUTIONAL? Most decidedly *constitutional*. Not a simple conjunctival affection, although the conjunctiva is a participant in it; but essentially and primarily a disease of the internal structures of the eye. How, these structures become affected by the causes which are said or thought to give origin to the disease, I do not pretend to say: all I dare venture upon is an opinion, that the blood is the medium of contamination. It would be worth while to transfuse the blood of the ophthalmic subject into healthy veins, with a view of ascertaining whether the disease were communicable in this manner. I cannot help imagining, myself, some analogy, in causation at least, between this disease and glanders and farcy; and in the latter we know that the blood is infected. In fine, altogether, I am more of a Colemanite in my opinions than anything else; still, not completely so.

THE TREATMENT of a disease, concerning whose nature the medical practitioner feels compelled to confess a good deal of ignorance, is not likely to turn out very satisfactory; and this happens to be one of those diseases in the treatment of which, while the result is such as is almost certain to deceive the

owner of the horse, so is the veterinarian himself apt to be deceived. A certain time after remedies, or rather after means regarded as remedial, have been employed, the eye apparently recovers ; but whether from the treatment adopted or from the disease having run its appointed course, is not easy to determine. Be this as it may, the prudent practitioner finds it necessary to accompany the "cure" of the patient with this advice to his master—that, since other attacks are likely to follow, either in the same eye or in the opposite one, or possibly in both, and every fresh attack will certainly leave the eye or eyes in a worse condition for vision than they were before, either the animal had better be parted with during the intermission, or, if kept, should as much as possible be preserved from those influences likely to favour a return of his complaint.

For a disease, one main feature of which is inflammation, we naturally enough resort to antiphlogistic measures ; and did inflammation constitute the essence of the disease, success would not fail to attend such potent remedies of this class as have at one time or other been employed.

BLOODLETTING, both topical and general, to the extremest degrees to which it could be carried, has been practised with no other good effect than that of suspending or temporarily arresting the inflammatory action. Blood has been drawn from the jugular vein of the same side as the affected eye until the animal has quite staggered under the evacuation ; the carotid artery of that side has been stopped by ligature ; nay, the vessels carrying on the inflammation, themselves, as they ran upon the cornea, have been severed by scarification and by cauterization, and all to no other purpose than that of checking, or, to appearances, subduing an inflammatory action which has been, after a time, sure to return with equal or even with redoubled force. A common inflammation, once fairly conquered, has no power to revive again ; at least, not in its original activity ; but as for the inflammation of periodic ophthalmia, it will return again and again, after having been, to appearance, overpowered ; and, in very opposition to our most strenuous endeavours, will march slowly or rapidly on, according as the case happens to

be acute or chronic in its character, to the ultimate destruction of the eye.

Notwithstanding all that has been said, however, we continue to practise bloodletting, and we do so for two reasons: first, because we think our patient derives *some* benefit from it, however transitory or unreal that may turn out to be; and, secondly, because we know of nothing that so summarily confers this apparent relief. And topical evacuations of blood seem to answer this purpose better than any large or general abstractions. Some practitioners open the angular vein of the eye, from which in general, by judicious operation and management, quite as much blood can be obtained as it seems prudent to take. Others prefer scarification of the conjunctiva; and where that membrane is much reddened, and appears injected or loaded with blood,* this is, perhaps, the best practice. There can be no harm, but good may result from practising first one and then the other of these operations.

FOMENTATIONS only do good as means of relaxing the blood-vessels, at the time blood is flowing from the eye or the eye-vein, and so enabling us to obtain a much larger efflux than we should without their aid. The best fomentation is warm water applied with a large sponge upon the lids.

From PURGATION I cannot say I have witnessed any benefit. I know it is, or used to be, a common practice to give a dose of physic on an attack of ophthalmia; but, as there appears so little reason to believe that the disease in the eyes is connected with any chylopoietic disorder, and as any evacuation from the bowels is not seen to produce any such effect on this as it does on common ophthalmia, or any ordinary inflammatory disease, I cannot myself imagine what good is to be answered by purgation.

WHAT MEDICINE OUGHT TO BE GIVEN?—For my own part, I can answer this question only by saying, that none that has hitherto been exhibited has proved a cure for the disease; at the same time I would not go so far as to assert no medicine that has been administered has not done some good. I have, myself, prescribed preparations of copper, iron, arsenic, silver, mercury, and iodine, all of them potent in action, and capable of being

* I never saw true *chemosis* in a horse's eye.

rendered poisonous ; but, save in the instance of mercury, with nothing like beneficial result ; and even mercury has been used in some cases with such doubtful impression on the disease that one could hardly say whether it had done good or not. Mr. Morton has spoken favorably of the prot-iodide of mercury, a preparation combining, in some degree, the powers both of mercury and iodine, besides, probably, other properties not to be found in either of them.

I will not pretend to recommend any medicine as a specific, or even as in every case to be depended upon as affording relief ; but that which I continue to put most faith in is mercury ; not mercury as exhibited in the common ineffective form, denominated *alterative* ; but mercury given in doses of one drachm of calomel, combined with five grains of opium, every eight hours, until palpable effect is produced on the mouth and breath.

COUNTER-IRRITATION is by some practitioners employed ; by others, not. A rowel may be inserted underneath the jaw : a seton may be passed underneath the skin below the eye ; a blister may be applied behind or below the ear, or—as was the practice with our professional predecessors, the farriers—a liquid blister may be rudely rubbed upon the lids of the affected eye, with the certain result of some of the vesicatory getting between the lids, and irritating the conjunctiva. What a barbarous practice this appears ! and yet it is often found to be, in the end, productive of good. Fresh and intense inflammation is temporarily excited by the acrid stimulation of the cantharides, and for some days afterwards it appears as if fuel had been added to the fire already existing ; but, ultimately, it mostly turns out that the eye clears, and becomes restored to a degree we could hardly have anticipated. I have seen my father pass setons of thread or silk through portions of the conjunctiva, leaving them hanging out of the eye until copious suppuration had come on ; and in some chronic cases a good deal of relief appeared in time to have been afforded by them.

COLLYRIA.—A good deal of change of opinion has taken place among medical men concerning the strength and proportionate efficacy of topical applications to mucous membranes : at one time mere astriction or slight stimulation was considered to be all the effect that was requisite or safe to be produced ;

nowadays, however, stimulation in the highest degree, verging even on an escharotic effect, is found to be, in most cases, both warrantable and beneficial. In gonorrhœa, formerly, surgeons would not go farther than a grain or two of sulphate of zinc, or a quarter of a grain of corrosive sublimate or lunar caustic, to the ounce of water; but now, there are medical practitioners bold enough to suppress an attack of gonorrhœa at once by an injection of lunar caustic of the strength even of a scruple to the ounce. Similar changes have taken place in regard to collyria. Now, a surgeon will order a lotion for the eye, composed of five grains of lunar caustic to the ounce of water, and an ointment of double that strength, when, formerly, he would hardly have ventured to use such a potent preparation at all, or certainly not in above half that strength. There is this difference, however, between the surgeon's and the veterinary surgeon's practice in this respect. The former decries the use of local applications—either in their astringent, stimulant, or escharotic forms—in internal ophthalmia; nay, in acute *internal* inflammations, positively forbids them; although he admits that, in conjunctival inflammations, more good is generally done by collyria and ointments than by any other remedy.

In VETERINARY PRACTICE, however, the case is different. On the principle that no two great actions or diseases can go on at the same time, *we* shall find it to be good practice to produce a highly stimulant, even an escharotic, effect on the conjunctival membrane, with a view of, by derivation or revulsion, relieving the internal ophthalmia; and this is a practice that might long ago have suggested itself to the veterinarian, from the known advantages which farriers, in their rude way, often obtained from the blisters they so unceremoniously and indiscriminately employed in ophthalmia: indeed, this may be said to constitute one of the few remnants of old practice veterinarians have done wrong to reject. The eye, even in a state of ophthalmia, will endure and derive advantage from applications of much more potent nature than are commonly ventured upon in practice. I use myself, as my favorite collyrium, a scruple of nitrate of silver to the ounce of distilled water. Should simple ointment or hog's lard be used in place of water, as the medium, double and ~~treble~~ that strength of the silver may be employed. Mr.

Cherry, the Principal Veterinary Surgeon to the Cavalry, has used bichloride of mercury as a collyrium in the potent form of solution in spirits of wine—5j to the 3j—and even has touched eyes with the sublimate itself; and his note, in regard to their effects, is—"it is of importance to remark how soon the very considerable effect excited by the injection of corrosive sublimate in solution has subsided; even the application of it in substance to the surface of the eye producing a scarcely perceptible effect." By others, a rod of lunar caustic has been used. We learn, indeed, both from practice and experiment, that our collyria, to do good, have been in general applied in too weak a form: we have not dared to do even what farriers before us did, and this is one reason why our practice, in many cases, has not turned out so successful as theirs. After blood has been freely drawn, topically, and when the brunt of the disease is evidently confined to the interior parts of the eyeball, the conjunctiva evincing but a secondary or sympathetic sort of inflammation, I think we are quite warranted in producing high counter-irritation in that membrane; and to effect this we shall find we must make use of washes, or ointments, or powders, a great deal stronger than those commonly used. At the same time I would introduce mercury into the system as quickly as I could, compatible with safety, and in some form or other establish counter-irritation: and when we have done this, in my humble opinion, we have accomplished somewhere about all that lies in our power by way of remedy for an attack of periodic ophthalmia.

In CHRONIC OPHTHALMIA, Mr. Dunn, V.S., is in the habit of using, with a good deal of advantage, as a topical application, an unguent composed of chloride of mercury and honey or treacle.

The EVACUATION OF THE AQUEOUS HUMOUR has, by Mr. Wardrop, been highly lauded as a remedy for ophthalmia in man; and I have often myself imagined that good might result from such practice in the acute stages of periodic ophthalmia, though I have never made trial of it. But there is a case on record, of which the result would very much dispose us to test an operation of the kind, one so simple that in proper hands it cannot well be productive of any harm. This "singular case" occurred to Mr. E. Price, V.S., Cork, and will be found in *The Veterinarian* for 1841, from which I extract it.

“A celebrated M.D., a great horse-amateur, and fond, withal, of a little bit of practice of his own whenever opportunity offered, had a mare that had frequent and severe attacks of ophthalmia, but more particularly of the left eye. On the last attack, and when inflammation was at the highest, he determined to scarify the conjunctiva. He was everting the lid for that purpose, when, from a sudden motion of the head, the lancet passed through the conjunctiva, cornea and all; the whole of the aqueous humour escaped, and the eye was in a partially collapsed state. The doctor considered that he had settled the business. However, to his surprise and gratification, *at the expiration of three days* the eye had assumed a more healthy appearance, *and in a few days more the inflammation had entirely subsided*, and it has not returned.”

CATARACT.

CATARACT—from *κατα ραττων*, breaking or disturbing, and so confounding, vision—is the term used by medical men to denote any opacity of the crystalline lens or its capsule. The central situation of the lenticular body in the eye, and the consequent necessity of all the rays of light in their passage to the retina making their transit through it, renders any impairment of its transparency of serious moment to the animal, causing, as it does, if not loss, imperfection of sight, and, by rendering him unfit for many services required of him, very materially reducing his value. Veterinary surgeons, on this account, have even a greater inducement than surgeons have to prevent the occurrence of, and seek some remedy for, cataract; yet, unfortunately, are we in one respect, if not in both, in means a long way behind the medical profession.

DIVISION.—A cataract is said to be either *true* or *spurious*.

A TRUE CATARACT is that which has already been defined to consist either in opacity of the lens itself or of its capsule, being *lenticular* in the former case, *capsular* in the latter: or it may consist in the effusion of opaque fluid between the two, constituting what has been called a *Morgagnian* or *interstitial cataract*.

A SPURIOUS CATARACT is that which, from its aspect and situation, is likely to be mistaken for a true cataract; and is found to consist in an effusion of lymph into the posterior

chamber of the eye, against or upon the anterior surface of the capsule of the lens.

A CAPSULO-LENTICULAR CATARACT is one of a *mixed* character, in which lens and capsule, and, necessarily, liquor Morgagni too, are all involved in opacity.

ANOTHER DISTINCTION OF CATARACTS arises out of the nature of their composition or consistence. Commonly, a cataract is *firm* or *hard*; at least, in most cases acquires consistence by age, though when first formed it may be of a *soft* nature—*caseous*, as sometimes it is called. D'Arboval speaks of a *fluid* cataract, one that from its whiteness often acquires the name of *milky*; I have no recollection of ever having seen one myself of this description. To these may be added *the osseous cataract*; of which Mr. Charles Percivall, V.S., Royal Artillery, has a fine specimen in his museum. This appears to be the ultimate change the lens undergoes, and one that is the result of many years' continuance of the cataract.*

CATARACTS DIFFER ALSO IN COLOUR OR SHADE.—Their colour not only depends upon their nature or consistence, but likewise upon the stage of formation they happen to be in, as well as upon their age or continuance. After attacks of ophthalmia, we behold the pupil changing from its natural clear dark blue, and acquiring a greyish or greenish tint, or, while contracted, having a dusky or blackish-blue aspect; eventually dilating and clearing again, to assume the last change—that of cataract.

The CAUSE OF CATARACT, speaking generally, in ninety cases out of a hundred probably, is periodic ophthalmia. One attack

* Examples of the same are recorded in human medicine. Mr. Wardrop, "in one case, besides the capsule of the lens being ossified, found several large but thin scales of bony matter dispersed throughout the vitreous humour, which in all probability were ossifications of the hyaloid membrane." The capsule has oftener been detected osseous than the lens itself. But in an eye sent to Mr. Wardrop by Mr. A. Burns, the central portion of the lens was converted into hard bone; the only instance Mr. W. ever met with in which ossification of the lens was unattended by ossification of the capsule. Dr. Mackenzie informs us, that a lens dislocated into the anterior chamber, in consequence of a blow on the eye, is very apt to become ossified.—*Mackenzie on the Diseases of the Eye.*

succeeds another until at length these changes become evident in the aspect and magnitude of the pupil which are known to betoken the supervention of cataract; and until this be completed we may look for returns at longer or shorter intervals of paroxysms of ophthalmia. Nor will, indeed, the maturation of the cataract be in every case followed by a subsidence of inflammatory action, though often, as a sort of crisis, it is seen to have this effect: in many cases, however, have I known the disease still to continue to relapse. Cataract has been known to be the product of a single attack of ophthalmia; but this is a rare case.

Mr. W. C. Spooner, V.S., Southampton, informs us, in *The Veterinarian* for 1840, that he has "known it supervene within a fortnight from the first attack."

The CATARACT OF OPHTHALMIA consists in a gradual change in the aspect and composition of the lens, and this commonly pervades all parts of the lenticular body at one and the same time. The earliest perceptible alterations in the pupil after one or more attacks of periodic ophthalmia, are: First, unusual irritability; it contracts quicker and more forcibly on exposure to light than that of a sound eye is known to do, and in consequence becomes actually smaller than the other. Secondly, the corpora nigra hang lower down than in health, shading more the superior parts of the pupil. Thirdly, viewed out of the glare of light, while in a state of dilatation, the pupil discloses the lens changed from its natural deep blue colour to that of a French grey. Should the iris contract adhesion with the capsule of the lens while the pupil is in this irritable and contracted state, which is often the case, this small pupil will become permanent, and we shall see nothing indicating confirmed cataract, until some white specks or streaks make their appearance through the aperture. In other cases, some changes take place of a glaucomatous nature, followed by others of an amaurotic tendency, which render the eye tolerant of light; and the result is, dilatation instead of contraction of the pupil, and the conversion of it into an amber-coloured or amber-green-coloured body, which ultimately, as in the other case, turns to a cataract. We read of cataracts being large and small, white, black, green, yellow, brown, or ash-coloured, &c. Such varied

descriptions being all reconcilable on the ground of the dependence for magnitude on the degree of contraction of the pupil ; and for colour, on the circumstance of its being the lens itself that we behold, or the vitreous humour, or other parts changed in colour, through it remaining unchanged ; the latter being that state of eye to which the appellation of glaucoma has been given.

The CATARACTOUS CHANGE is a general, not a partial one. We do not, in the cataract arising from periodic ophthalmia, perceive any distinct and separate nucleus or focal point of opacity ; but we discover commonly a general cloudiness pervading the entire lens, and this speedily resolves itself into streaks of white or *nebula*, running from the circumference in radii towards the centre. There is a species of cataract which begins in a small white speck, no larger at first than a pin's point, in the very heart of the lenticular body ; but this is not, I believe, to be regarded as the offspring of periodic ophthalmia, although I have known the latter disease attack an eye in which such a cataract already existed.

In October, 1841, a black mare, three years old, was recruited for the First Life Guards, having in her off eye a cataract, consisting in a white speck of the magnitude of a millet-seed, in the very centre of the lens, and which was by no means easy of discernment, save to any one accustomed to examine eyes. The dealer, an acute observer in his way, declared he had not been able to detect it until the mode of doing so was pointed out to him. My opinion was, that it was a cataract of a kind which had no connexion with periodic ophthalmia, and that it might remain, for years even, *in statu quo*. On the 22d of April following—six months afterwards—she was brought to me with ophthalmia in the cataractous eye ; of which she was discharged “cured” on the 8th of May. Again she returned, however, on the 18th of June, with another attack ; and again left the infirmary ; but now, with her eye changed in aspect, lustreless, obscured, contracted in pupil, and intolerant of light : evidently, in fact, breeding cataract, in which state it will probably continue until it shall experience another relapse.

A SPONTANEOUS CATARACT I believe this to be, if there be any such thing in horses. Several cases like it stand on record, some of which I shall introduce by way of illustration here ; from which we may glean that it differs essentially from the cataract of ophthalmia in formation and appearance, and in the

circumstance of being unattended with any disease or change in other parts of the eye. To which may be added another circumstance by way of distinction : and this is, that in general it is by mere accident the cataract is discovered ; and to all our inquiries the answer is, “ never to my knowledge has the horse had diseased or weak eyes.”

TWO FOCAL POINTS have been observed in the formation of a cataract of this description ; at least such appear to have existed in the following case, sent to *The Veterinarian* for 1834, by Mr. Harris, V.S., Bromyard.

“ A bay mare, coming five years old, when first broken, two years ago, was accidentally submitted to my inspection. I perceived *two* small cataracts in the off eye. After close inquiry, *I could not hear that any symptoms of inflammation had been observed.* From that time she has remained free from ophthalmia, although exposed to causes likely to produce it ; and when, a week ago, she came under my treatment for lameness, there was but one cataract remaining.”

Were the cataracts in this case *capsular* or *lenticular* ?

Mr. Cartwright mentions a case wherein “ the horse had two cataracts *in each eye* ; two of them being about the size of large pins’ heads, the other two treble that size.”

CONGENITAL CATARACT constitutes another kind of the original or spontaneous class. Gibson speaks of horses being “ foaled with cataracts or pearls in their eyes.” In man congenital cataract commonly affects both the lens and its capsule. “ I believe it,” says Dr. Mackenzie, “ to be at first lenticular, and that after some months it becomes capsulo-lenticular.” Mr. Harris, the gentleman above referred to, has likewise favoured us, in the same *Veterinarian*, with a case of the congenital description.

“ An otherwise healthy foal was observed to have defective eyes, I think, *the second day after birth*, when I discovered a large cataract in the centre of each eye (without the slightest appearance of inflammation) which nearly destroyed vision in a strong light, and caused him to roam about, and turn his head in different directions, in order to catch a sight of the objects around him ; but when he was removed to a dark stable, he appeared satisfied, and like other foals.” Whether the foal was destroyed or died of disease, Mr. Harris could never ascertain, though the case furnished an undoubted “ proof of the formation of cataract without inflammation, or that ophthalmia may affect the fœtus in utero.”

Mr. Hales, of Oswestry, has only seen one case of congenital cataract. "Five years ago," says Mr. H——, "a gentleman of this neighbourhood wished me to examine the eyes of a foal a few days old, which was foaled blind. I found a perfect cataract in each eye. I stopped the same gentleman's team a week ago, as it was passing my door. The cataracts were both there, and the horse remains, of course, totally blind.

CAPSULAR CATARACT, that form of the disease, so called, in which the opacity occupies the capsule, exclusively, of the lens, has no relation whatever to the lenticular affection, nor is it anywise connected with periodic ophthalmia. I believe it, myself, to be the product of common inflammatory action, and that its most frequent origin is injury of some sort, either to the eye itself or to some of its appendages, or even to the parts adjacent. It is the anterior hemisphere of the capsule which becomes opaque, that being thicker and more vascular than the posterior: the latter never, I believe, is found diseased. On this account, the disease is in general not difficult for the close and accurate examiner to distinguish from the lenticular: taking a side view of the eye, and properly guiding the light to it, we shall, perhaps, be able to detect transparency behind the cataract, to see, as it were, in the rear of it. It appears to have been this kind of cataract, or, if not this, the spurious kind, which has been said and shown to be absorbable.

The ORIGIN AND FORMATION OF CATARACT constitutes one of those branches of science, that, on account of the little that is known for certain concerning the structure and organization of the lens, has given license for a great deal of speculative opinion, into which there will be no occasion for us to enter here. It will be sufficient for us to know that in the horse its common originator is periodic ophthalmia: at the same time, we must not shut our eyes to the fact of cataract having been known in many instances to arise independently of this disease; and that in some of these recorded cases, it has all the appearance of being a disease *sui generis*. And farther, the case I have mentioned* would seem to show, that although such a cataract may exist, yet is the eye, the same as sound

* At page 105.

eyes, disposed to take the periodic ophthalmia. It might be asked me—"was the original cataract not itself the effect of ophthalmia?" to which I should reply, "certainly not." Itself had no such character; neither did the eye evince the slightest shade of imperfection in which it existed. The real origin and nature of this cataract I do not pretend to know.

CAN A CATARACT BE ABSORBED, AND THUS DISAPPEAR? This question I answer affirmatively; and my reason for so doing will be found in the cases which I have thought it worth while to annex to this account. Should I be asked, Of what class or kind absorbable cataracts are? I must still refer my inquirer to the valuable collection of cases which I have been able to glean from the pages, chiefly, of *The Veterinarian*. Some who disbelieve either that any such cataracts ever had existence, or that, if they had, by any chance they could become absorbed, may be told, if analogical facts and reasoning will have any weight with them, that cases of the same description are not wanting in human medicine, and which are supported upon unquestionable authority. Dr. Mackenzie, of Glasgow, whose work, *A Practical Treatise on the Diseases of the (Human) Eye*, I believe stands as high as any ophthalmic treatise of the day, informs us—

"When the term *cataract* is used without any appellative lenticular opacity is generally meant. For instance, when we say that cataract is a slow disease, occupying one, two or more years in its progress, it is of lenticular cataract that we speak; *for all the others*, and especially the spurious cataracts, *may be the product of a few days or hours*. It sometimes happens, however, that *even lenticular cataract is fully developed in a very short space of time*. A patient was attending at the Glasgow Eye Infirmary with glaucoma and amaurosis of one eye, but without any appearance of cataract. She was present as usual, on a Monday or Wednesday, the eye exhibiting exactly the appearances which it had done for months before. On the Friday I was surprised to find the lens completely opaque, and stellated by radiating lines running from its centre. Richter, however, relates a case in which *cataract was completely formed in the course of one night*. Mr. Walker was of opinion that blacksmiths, and all mechanics who work near

large fires, were more subject to cataracts than other persons; and he mentions that he had two patients who were *instantly seized with cataract* at the very time they were thus employed.

Another reason for doubting or discrediting the accounts given of these cataracts, is, that they have vanished or become absorbed and left the eye as bright as ever. But, may not that which has come quickly go quickly? It does not appear to me that one is more irreconcilable with the laws of physiology than the other; although I am ready to admit, that cases proving the absorption of *true* or genuine cataract are hardly to be found on authentic record. Indeed, we have the respectable authority of Mr. H. W. Cooper, Surgeon to the Honourable Artillery Company, in *The Veterinarian* for 1841, for saying, that, in the human subject, *a decided opacity of the lenticular capsule has never been observed to disappear*. This would almost drive one to think that the opacities taken for cataracts, in some of the cases which will be subjoined, must have been *spurious* in their nature: spurious or true, however, I firmly believe myself that there they were, in the situations in which they were discovered, and that there they were not when they came to be looked for again.

The trial of Roberts *versus* Croft it was that gave rise to more information being elicited concerning cataract than, prior to that occurrence, was to be found in the whole annals of veterinary medicine: records were searched, and by-gone cases and observations recalled to memory, and the result was, the publication of a number of interesting facts and opinions, which, with some yet to come, will one day or other set the subject of cataract in a much clearer light than that through which we have been compelled to view it up to the present day.

The horse, the subject of this trial—a full account of which will be found in *The Veterinarian* for 1832—was, after being sold to Mrs. Roberts, incidentally discovered to have a small cataract in one of his eyes, of the existence of which Mr. Croft, the vendor, a surgeon, was not only entirely ignorant, but for which he felt quite at a loss to account, he having bred the horse, and been therefore certain that the animal never experienced ophthalmic disorder. It being, from the evidence

adduced, however, considered that the cataract could not possibly form within twenty-four days, the period the animal's eyes remained unexamined, the jury concluded that the cataract must have existed prior to sale, and on that ground gave the plaintiff their verdict.

Mr. Cartwright, V.S., Whitechurch, in *The Veterinarian* for 1834, revives this interesting subject in the shape of an analysis of and commentary on this trial; and so much to the purpose are his remarks, that I feel I need offer no apology for introducing them here to my reader.

On this trial, "Messrs. Hickman of Shrewsbury, Collier of Chester, and Richards and Crow of Shrewsbury, veterinary surgeons, all gave evidence, 'that a cataract *never forms* in the horse except as the consequence of repeated inflammation in the eye.'"

"Mr. Clay, of Shrewsbury, examined for the defendant, said, 'that cataracts may be formed in a fortnight or three weeks, and that he has known *many* instances where they had been formed in *less time*; that he has known them to be formed *without active inflammation*, and *without any previous apparent disease of the eyes*; and has detected them when the owners had not the slightest suspicion of any disease in the eyes, and had declared that no previous inflammation had been observed. He (Mr. Clay) thought it not improbable that a small cataract like the one in question might form between the time that the horse was sold and that when the disease was discovered,' which was either ten or twenty-four days; the period being, as remarked by Mr. Cartwright, apparently 'disputed,' and in consequence making 'material difference.'"

Mr. Hickman, desirous of having so important a question answered by the highest authorities, wrote both to Mr. Coleman and Mr. Apperley. In his letter to the Professor, he reminded him that, when a pupil at the College, he was taught by lectures "that cataracts never appear suddenly or without previous inflammation in the horse; but not so in the human subject." Mr. Hickman, receiving no reply to his letter from the Professor, submitted the three following questions to Mr. Apperley—

1. "Do cataracts appear in the eye of the horse suddenly, without the eye first being in a state of inflammation?"

"*Certainly not.*"

2. "Do you think that a cataract could have formed within twenty days without previous inflammation?"

"*I never knew nor heard of such a case.*"

3. "Should you not consider the cataract, or the diseased action which caused the cataract, to be in the eye or in the system on the day the horse was sold by Mr. Croft?"

"It is my opinion that the diseased action, the predisposing cause, must have existed previously to the first-named period," viz., the day of sale.

"Mr. Croft's horse afterwards came into the possession of Mr. Watson, a surgeon in Ellesmere, who disposed of him this summer, and *he had then no cataract whatever* (as I have been informed), his eyes being perfectly sound in every respect. Now it appears to me," continues Mr. Cartwright, "that this was a case of *capsular cataract*; yet, when or how it was formed, I cannot say; but from the testimony of Mr. Croft, who is a very respectable gentleman, and in the medical profession, and who, I believe, bred the horse; and also from that of his bailiff and groom, and that of the colt-breaker who broke him in, who all assert that they never saw the horse with inflamed eyes, we must suppose that he never had any *apparent* attacks of inflammation, such as to produce cataract; and I am also induced to come to this conclusion from having seen, since that time, two other similar cases, which I will now relate:

"The first was a chestnut horse, five years old, the property of Mr. Hort, in this town (Whitchurch), which had *two* cataracts in *each* eye: two of them were about the size of large pins' heads, the other two treble that size: his eyes were perfectly transparent, with the above exceptions, and did not show the least vestige of former inflammation, and which the person that bred him said he had never been subject to. Mr. Hort sold him, about the month of December, 1831, to a Mr. Dawson, of Burleydam, with these cataracts evident enough; but from that time they gradually disappeared, and in the autumn 1832 there was not the least to be seen of them. I saw him a few days ago, when his eyes were perfectly sound."

"The other case is a five-year-old black cob mare, the property of Mr. Wray, of Ightfield Heath (four miles from this place), who purchased her of a Mr. Pownall, of Darliston, some time in 1832. In November of the same year I saw her, and detected a cataract in the right eye, and of the size of a coriander seed. I then advised him to get rid of her, thinking that she would go blind; but, being a very useful thing, he kept her. In August 1833 I saw her again, when the cataract had disappeared, and her eyes were perfect, I have spoken to Mr. Pownall respecting her, who informed me that he had never seen anything the matter with her eyes; and Mr. Wray says, he never did, with the exception of the cataract."

"I believe it is the opinion of veterinary surgeons and authors *generally*, that cataracts never form without previous inflammation; and English authors, I think, are *totally* silent respecting the disappearing of them when formed."

"Mr. Blaine says, 'that cataract never appears in the human subject as a distinct disease, independent of active inflammation or ophthalmia.'"

"Mr. Percivall says, 'that it will be found to be, invariably in horses, one of the consequences of ophthalmia; for, in cases where no signs of increased action have attended its apparent formation, they may *generally* be discovered

to have existed at no very remote period preceding it. *I do not mean to assert that it never happens without inflammation*: I have heard, and so far I believe, that it does: *but it certainly is, comparatively, a rare occurrence.*”

“Mr. Gibson says, ‘that some (horses) have been foaled with cataracts or pearls in their eyes.’”

“Now, after all that has been said, we must come to this conclusion, that here are three cases of cataracts that had existed for many months, and, in some of them, most probably for a year or two, and that have entirely disappeared, leaving the eye in a sound transparent state; and that were, in every probability, produced without the usual symptoms of that specific inflammation which is *generally* the precursor of cataracts.”

“I am perfectly aware that it may be said that they have been foaled so; but I am not inclined to believe this, as it is most probable that they would have been sooner absorbed. In my mind, the depositions were of far more recent date.”

Mr. Cartwright concludes his comments with a hope that Mr. Clay “will favour the public with the cases on which his opinion (on the trial) was founded.”

In the mean time, Mr. Perry, V.S., Swaffham, Norfolk—prompted by the perusal of Mr. Cartwright’s observations—in the same *Veterinarian*, comes forward and says, “I have met with *many* cases where there has been one or more inconsiderable opaque spots on the lens that have not been preceded by inflammation, whose presence I have never been able to satisfy myself has in any way impaired vision:” adding the following case—

“Some time since I called on a friend who was anxious to show me his mare, not professionally, but because he had formed an exceeding high opinion of her. When she was led to the door of the stable I discovered she had two cataracts. I mentioned the circumstance to him, but he could scarcely credit it; and he assured me that the animal was bred by himself, that she never had been ill in any respect, and that her eyes had ever been bright and free from disease.” “I have generally,” continues Mr. Perry, “observed that cataracts, when formed of these small distinct bodies *on* the lens, although they have assumed a dense appearance, have been productive of no mischief. It is when they form *in the centre of the lens, assuming the appearance of rings*, slightly clouding the transparency of the lens, and not dense as the former, that they are to be dreaded; and this appearance I believe to be always the effect of inflammation.” “A friend of mine, a surgeon in this town, purchased a bay pony with a cataract in each eye: he was

ignorant of the fact until he showed the animal to me. They were in appearance extremely dense, *formed in the centre of the lens*, about the size of small white peas; and although the lens was transparent on each side, I conceived the vision of the pony must have been imperfect; but his owner continued to ride and drive him many years; and he has frequently assured me that he was the safest animal that he ever possessed, and that he never discovered any defect of vision."

Mr. W. C. Spooner, V.S. (then at Winchester, now at Southampton), is the gentleman who next enters this interesting field of investigation; and he commences with stating, that he thinks the facts brought forward by Messrs. Cartwright and Perry set one question at rest, viz., "*that cataract may and does occur independently of previous active inflammation.*"

"Mr. Cartwright says that a cataract may take place in a month; this I believe, for I have known it occur in less time. Mr. Clay avers the same; but he does not say, nor do any of his cases show, that it can be produced in this short period without acute inflammation." "Then, again, no one imagines, that, when cataract occurs as the sequel of active inflammation, it ever becomes absorbed." "The forms and duration of ophthalmia, the frequency of its attacks, and the degree of disorganization produced by each attack, are extremely uncertain and dissimilar."

"The two following cases will, in some measure, corroborate Mr. Cartwright's remarks:

"A four-year-old horse was bought two years and a half since, when I discovered small cataracts in each eye. I rode him, and, though he did not shy, he would blunder against a rail or gate. He was put to fast work in a mail, where he still continues, and he has had no inflammation in his eyes since; and when I last saw him, a few months ago, the cataracts were much the same.

"Some time since I was requested to examine a horse that was lame, when I perceived a cataract in one eye. The owner, a surgeon, said he had had no inflammatory attack during the three months he had been in his possession; and the previous possessor denied anything being the matter with his eyes before."

Mr. Spooner's observations were followed by some remarks (in the same *Veterinarian*) of my own: before, however, I refer to them, I shall lay before my reader some cases in elucidation of the same subject from Mr. Harris, V.S., Bromyard.

"A bay mare, now coming five years old, when first broken two years ago,

was accidentally submitted to my inspection. I perceived *two* small cataracts in the off eye. After close inquiry I could not hear that any symptoms of inflammation had been observed, and from that time until now the disease has not progressed; but when, a week ago, she came under my treatment for lameness, *there was but one cataract remaining.*

"A half-bred gelding had ophthalmia when two or three years old, and a cataract was the result. I had an opportunity of examining his eyes several times within the next two or three years. The cataract was evidently diminishing, and when, some months afterwards, I looked for it, *it was gone.*"

Mr. Hales, V.S., Oswestry, a gentleman well known to the readers of *The Veterinarian*, in July of the same year, 1834, communicates to us important information on the same subject; he being, as he says, "the first veterinarian in his district that publicly avowed that cataracts sometimes formed without previous inflammation, if not the first who entertained such an opinion."

Mr. Hales continues, "I have for some years been convinced of the fact, that small cataracts are observed in the eye of the horse without their having been preceded by inflammation; and I have in my memory at this moment half-a-dozen cases that have so arisen. In several of them, the owners of the horses were unconscious of any disease in the eye, and have assured me they had not the slightest suspicion that the eye was not perfectly good. Mr. Croft's case (alluding to the trial of Roberts *versus* Croft) is precisely in point." "In these kinds of cataracts there is no difference to be seen between the eye affected by the disease and a healthy one, except the appearance of the cataract; they are equally clear and lucid, which, I believe, is never the case when once the eye has been attacked with specific ophthalmia. The opacity is small and well defined, and I consider its seat to be the capsule of the lens.

"Mr. Percivall, Mr. Cartwright, and Mr. Harris, state that they have known cases in which cataracts have been absorbed." "It has never fallen to my lot to see a case of this description.

"Two years ago I bought a horse from a friend, and having known the animal for a long time, and being satisfied my friend would not deceive me, I made no examination of him at the time of purchase. But, on the morning after he was delivered, I found *one eye inflamed*, and, on looking into it, saw what I considered to be a cataract, about the size of rather a large pin's head. I made up my mind that I was done, and wrote to the gentleman on the subject; who, in reply, declared that he had never seen or known anything the matter with the horse's eye, but would take him back if required to do so. Examining the eye very attentively the next day, I thought *I could perceive a slight motion in the speck, and that it did not exactly keep the same situation.*

I now began to waver in my opinion whether it was a cataract, and resolved to keep the horse until I saw the result. In a few days the inflammation subsided, and in *about a fortnight the opacity was gone.* "I consider the opaque spot in this case to have been *a small portion of condensed coagulable lymph in the posterior chamber of the eye*, the product of accidental inflammation. I am quite convinced that, had this horse been brought to me for casual examination, I should have pronounced him to have had a cataract; and had I not seen him again for some considerable time, and then found that the opacity was gone, I, no doubt, should have asserted that the cataract had been absorbed."

Mr. Clay, V.S., Shrewsbury, whose evidence on the trial, which has incidentally been productive of so much valuable discussion on the subject before us, was both of a novel and most important character, kindly afterwards, in *The Veterinarian* for the same year, 1834, at my request, favoured the profession with "some of the cases on which his opinion of the formation of cataract in the eye of the horse was founded." Those opinions being, 1st, "That he had known cataract form without active inflammation, or without any previous apparent disease in the eye." 2dly, "That he had detected small cataracts when the owners (of the horses) had not the slightest suspicion of any disease in the eye, and had denied that any previous inflammation had ever been observed." 3dly, I may be at liberty to add, though Mr. Clay has not, as shown by two out of the three cases reported, that he has known cataracts to be absorbed; and 4thly, also, That it is surprising how little some cataracts appear to disturb or diminish vision.

CASE I.—"A filly foal, the property of the Rev. Dr. Gardner, of Sansaw, had cataract in both eyes without inflammation. This filly having run a nail into one of her fore feet, when about *a fortnight old*, I was requested to see her. While waiting in the box for an assistant, I amused myself by looking at her eyes. *There was not then the least appearance of cataract*, or any other disease of the eye; *but in nine or ten days after this I observed a cataract in the near eye*, about the size of a small pin's head. My attention was then drawn to the off eye, but, after a most minute examination, *I could not detect the slightest appearance of cataract in it*; yet *about four or five days after this*, when I again visited Sansaw, and upon a second examination of the off eye, *a cataract was as visible as in the near eye*. At the end of six weeks from the time I first saw her, these cataracts were of the size of a large pin's head. The filly remained in the Doctor's possession until seven

years old, the cataracts continuing much the same. I had not an opportunity of looking at her eyes from this time until she was got up for sale, at seven years old. I then examined them, and, to my astonishment, found there was not the least appearance of cataract. She was sent to Rudgley fair, and sold to a London dealer, quite sound."

CASE II.—"Mr. S. Durston, of Stanwardine, a most respectable gentleman farmer, and well known as a fox-hunter in this county, had a black mare of his own breeding with cataracts in both eyes, of which he had not the slightest knowledge until a gentleman who came to buy her detected them. Mr. D. expressed himself much surprised, and said, 'A safer mare across a country could not be, as a hunter.' I myself, and every sportsman in this country, can corroborate Mr. D.'s assertion. This being an extraordinary case, Mr. D. wished me to see her. The cataracts were then very visible. She is now in the possession of Mr. Thos. Matthews, of Lee Hall, another gentleman equally well known in our hunt, for whom I, about three months ago, fired her legs. The cataracts were much the same as when I first saw them, which was about seven years ago."

CASE III.—"A mare, the property of my father, which I rode as a hack several years, had cataract without inflammation. After riding her two or three years, on her being led out of the stable one day, I noticed something unusual in one of her eyes, which, on examination, proved to be a cataract, and must have been of very recent formation, as no one rode her except myself. This cataract never afterwards varied so long as she remained in my father's possession, which was many years, as hack and brood-mare."

An anonymous writer, under the signature of C. P. N., communicates in *The Veterinarian* for the same year, 1834, the following interesting case, which would have been more valuable had it duly authenticated :

"A hack mare, about five years old, was brought to me for an accident to the near eye. When I went towards her, she appeared to be very shy, and while at a distance I could plainly perceive a white round speck in the centre of the lens of the other eye ; and after inquiring if there had been anything the matter with her eyes before, the owner replied in the negative. Showing the cataract to a few attendants, and it was very perceptible to them all, I averred that it would end in blindness. But, calling in about six weeks at the farm-house whence she came, I was astonished to find that the speck which, according to my prediction, was sure to cause blindness, had been absorbed, and not a vestige of it was to be seen."

Mr. W. C. Spooner, V.S., Southampton, "thinks it has been by this time pretty well proved that cataracts do *occasionally* become absorbed ;" and relates the following "singular

case corroboratory of this doctrine," in *The Veterinarian* for 1834 :

"On the 23d of May last, 1834, I was requested by Capt. Ward, of Twyford, to see his old mare : she had inflammation in one of her eyes, which was dim and very susceptible of light. On opening the eyelids, *I distinctly perceived a small cataract*. On inquiry, Capt. W. informed me that some years since she had several attacks of inflammation, but not one for the last three or four years ; and the groom said he had observed the speck for several years. I bled the mare from the jugular vein, gave her a dose of physic, and desired that the eye be kept wetted. I heard nothing more of the case till July 7th, when the mare was brought to my forge to be shod. *I examined her eyes, and could perceive no speck of any kind*, or impediment in vision. Query, Was this a case in which the absorbents were roused into action by the stimulus of inflammation, and the cataract was thereby removed ? But, let us suppose that this mare had been sold in May last, and brought to me to be examined by the buyer, and that I had pronounced her unsound, and that an action was the consequence ; I should have stated in court that I had examined her, and had found a cataract ; but against me, perhaps, there might be arrayed two or three veterinary surgeons, who might have examined the mare within a short period, and pronounced her sound ; the result would have probably been that the jury would have given their verdict against my employer, and have charitably considered that, if there had been any impediment in vision about the case, it existed in my eyes instead of in the mare's."

M. Richard Rawlins, sen., V.S., Bristol, in *The Veterinarian* for 1835, has favoured us with opinions on this subject "founded on more than twenty years' extensive practice, which we must not fail to profit by. "I never saw," he says, "a single case of cataract without previous disease of the eye ; but a circumstance occurred in the autumn of the last year, 1834, which did for a while surprise and stagger me. There was a case in which *cataract did seem to appear most suddenly, and without any previously observed disease.*"

On the 18th of October a horse was purchased, warranted sound, of a dealer in Bristol. The horse, it was remarked at the time, had a cough ; but it was answered, that was "a mere trifle," and a special warranty should be given against it. On his arrival at the purchaser's the horse was attacked with pneumonia, for which he was taken to Mr. R.'s infirmary. On entering the stable there, the animal ran against the door-post. This led to an examination of his eyes, "in each of which was a slight cataract," The

horse recovered of his chest affection, and was afterwards sold at a very reduced price, "being then quite blind."

About the same time—October, 1834—Mr. R. was consulted about lameness in a horse, a favourite with his master, and after giving his opinion concerning this, remarked, "Your horse has a worse disease, and which, I fear, is incurable. Look at the off eye, and you will perceive the forerunner of much mischief." The gentleman, astonished and angry, said he "had had the horse three or four years, and that there never had been anything the matter with the eyes, and that there was nothing now." Mr. R. was forbidden to do anything to the eye, although the disease continued progressing. About a month afterwards the gentleman called at Mr. R.'s house, and said he was "sorry to confess that Mr. R.'s opinion was accurate." The eye was weeping, and its diseased state could no longer be denied. Proper means were adopted; but cataract gradually formed, and the horse is now quite blind.

"Is it not probable," Mr. Rawlins asks, "that on such circumstances as these the opinion (I believe erroneous) was founded, that cataract can appear without previous ophthalmia?"

Seven years elapse, and Mr. Cartwright resumes the subject in *The Veterinarian* for 1841. Messrs. Pott, Lucas, Hey, and Abernethy, all surgeons of the first eminence of their day, thought that capsular cataracts were sometimes absorbed. Mr. Tyrrell, Professor Owen, and Mr. H. W. Cooper (Surgeon to the Honourable Artillery Company), are of a different opinion; they say "they never do." Among veterinarians, Messrs. Clay, Harris, Spooner, Cartwright, and myself, think with Mr. Abernethy, that a cataract may disappear.

Mr. H. W. Cooper, the gentleman above alluded to, at the time that the subject was brought afresh to our notice, in a praiseworthy spirit stepped forward; and, by sending two very interesting communications to *The Veterinarian*, lent us a helping hand in unravelling this intricate question.

"The point in question," says Mr. Cooper, referring to a query put by Mr. Cartwright, "would appear to be 'whether small cataracts, from the size of a coriander-seed downward, and which are supposed by veterinary surgeons to be capsular, are ever absorbed, and the capsule become transparent again.'"

"These small cataracts," continues Mr. Cooper, in his communication to *The Veterinarian* for 1841, "are, I presume, partial opacities of the capsule,

and are not uncommon in the human subject. I have a case now under my observation which illustrates the point beautifully. In the centre of the pupil of each eye a white spot may be discerned, and upon careful examination this is clearly seen to be an opacity of the capsule of the lens, that body being evidently immediately posterior to it. These opacities have existed for some time, and are slowly but decidedly increasing.”—“*I have never yet observed, in the human subject, a decided opacity of the lenticular capsule to disappear.* Instances have come under my notice of lymph being deposited upon the capsule during iritis, and closely resembling in appearance an opacity of that membrane, which lymph has been afterwards absorbed; but these spurious cataracts must not be confounded with genuine.

This leads me to the question, ‘whether lenticular cataracts ever become absorbed in the human subject, leaving the eye transparent.’ Without saying that such an event is impossible, *I am not aware of any really well-authenticated case on record.* We certainly hear of remedies to cure cataract without operation, and ever and anon these are stated to have worked wonders; but I fear the cases related will not bear investigation; and the simple fact that, one after the other, these ‘remedies’ have fallen into disrepute, is the best proof of their inefficacy. In fact, *we have yet to learn whether true cataract is capable of being cured by remedial measures, without having recourse to operation.* I believe that, under certain circumstances, the disease may be retarded by treatment; but I fear that the present state of our knowledge will not honestly carry us beyond this point.”

Mr. Liston, on the same point, says:* “Cataract sometimes, though rarely, disappears spontaneously, being absorbed.” But in another place, “Many remedies, external and internal, and mercury among the rest, have been employed with a view of dissipating cataracts; but all are of no use.”

My own practical remarks shall be added to these extremely interesting accounts, and then we will sift what we can out of the materials in our possession.

Although the case I am going to relate occurred so long ago as 1826, yet had it escaped, among a mass of *notabilia*, my memory; and might, indeed, have lain dormant to the present time, had it not been called into existence in *The Veterinarian* for 1834, by the perusal of some interesting papers on the subject of the trial of Roberts *versus* Croft. Mr. Courtney, then resident at Lee, brought his horse one morning to the Horse Infirmary at Woolwich, in consequence of its having fallen with him on his way to town, and cut its knees and grazed one of its eyebrows. The injuries in the knees

* In his ‘Elements of Surgery.’

were hardly skin-deep, and but of trifling consequence; but, on my attention being drawn to the eye, I observed the cornea to be partially nebulous, and a cataract to be plainly visible through the pupil, and the conjunctiva to be inflamed. Neither of the opacities was hardly apparent enough to attract any one's notice but that of a professional person; and both were quite unconnected with the slight bruise the orbital arch had sustained by the fall not above an hour or so before. Mr. C. expressed himself much surprised at the disclosure of all this disease in the horse's eye, saying that, to his knowledge, the horse had on no occasion manifested any signs of weak or inflamed eyes. I opened the eye-vein, and it bled very freely; and I gave the animal a dose of physic, and ordered a lead-wash, with a little tincture of opium in it, for the eye. I told Mr. C. that I might probably succeed in removing the corneal opacity, but that the cataract he might regard as beyond my reach. He returned with his horse on the fifth day, saying that the physic had operated briskly, but was now set, and that he himself thought the eye looked quite well again. I examined it, and could discover neither any relics of the corneal opacity nor of cataract.

In 1832, while my regiment was stationed at Windsor, Mr. R. showed me a favourite blood filly of his, three years old, very handsome, and of his own breeding. I was "looking round her," as the phrase goes, when, by mere accident, I discovered that she in one of her eyes—I forget which—had got a cataract; but such a one, I thought, and I believe said at the time, as I did not remember to have seen before. It was, to use Mr. Cartwright's comparison, in point of magnitude, "of the size of a coriander-seed," and exhibited to the eye of the observer a well-defined insulated white speck, surrounded and rendered still more perceptible by the clear blue of the pupil. It seemed to me to present to the beholder much the same appearance that a speck upon the cornea would produce, were it possible to view it through the pupil from the back of the eye. I saw this filly again the following year, 1833, when the cataract still existed, and *in statu quo*; but I have not seen her since.

In conclusion, I shall relate a case of very recent occurrence, which has operated in my mind with greater force to remove the difficulties by which the resolution of these questions is beset, than anything that has yet come under my own observation.

On the 10th of September, 1842, a lot of young horses were submitted to be taken into the service as troopers. One among them, a three-year-old black mare, fifteen hands high, betrayed an opacity in her near eye, with the mark of a blow upon the orbital arch of the same side, and also a contusion—apparently from a kick—on the near fore-leg. The opacity was in the pupil, and appeared albugineous and diffuse rather in its character; and

withal, was so plainly perceptible that any casual observer could see it without difficulty: moreover, while I was closely and attentively examining the eye, it appeared to me I could distinctly see *behind the opacity*. My friend, Dr. Campbell, passing at the time, I availed myself of his professional opinion. After careful and close inspection, and comparison of one eye with the other, Dr. Campbell gave it as his opinion that it was a cataract of the *spurious* kind, that it consisted, in fact, of matter deposited in the posterior chamber, a portion of which he thought he could perceive within the circumference of the pupil. Notwithstanding I pronounced the horse unsound in consequence of it, I accompanied my condemnatory judgment with a recommendation that the mare be not rejected on account of her eye; it being my opinion that the "cataract" was of a nature that had been said, and seemed to me to be, absorbable. Three weeks from this time—I not having seen the mare in the interval—her eye was free from all opacity.

On a subject of so much consequence as this, and one concerning which it is of so much importance that we should hold consonant opinions, I hope my readers will not feel that I have unnecessarily taken up their time or my own pages in the transcription of cases I have made: all that remains to be done is to come to the safest deductions we can from the various facts and opinions contained in the recited cases.

FIRST, it appears that cataract may arise from other causes, save periodic ophthalmia, although that disease must still be admitted to be the ordinary precursor of it.

SECONDLY, that cataract may form without any detectible pre-existing inflammation whatever in the eye.

THIRDLY, that cataracts may form within a comparatively short time—a few days, perhaps.

FOURTHLY, that, in an equally short time, cataracts may disappear or become absorbed.

FIFTHLY, that cataracts, bearing this evanescent or absorbable character, are certainly not of the lenticular class: they may be capsular; but, in my opinion, are more likely to turn out of the *spurious* description.

SIXTHLY: it appears quite certain that cataract, the product of periodic ophthalmia, has never been known to undergo absorption, or even any change for the better.

Future observation, with these questionable points fresh in our minds, will enable us, at no very remote day, to speak with more confidence than we can well do at present; a few such

trials as that of Roberts *versus* Croft, will set veterinary surgeons to work in collecting materials whereon they may erect defences for their professional opinions, and not, by any discrepancy of evidence, run a risk of having their reputations undervalued.

THE VISION ENJOYED BY HORSES HAVING CATARACTOUS EYES will depend upon the nature of the cataract, and the progress it has made towards maturity. Should the cataract consist in a general nebulosity of the lens, the degree of opacity will regulate the vision remaining; on the other hand, should the cataract grow from a central speck of opacity, the sight will be proportional to the largeness or growth of the nucleal deposit. And in this latter case, during the growth of the cataract, the sight will be regulated by the degree of contraction of the pupil: in bright lights, in consequence of the pupil being contracted, vision will be nothing like so good as in twilights, when the pupil regains a state of dilatation; simply because the rays of light, in the latter case, are able still to obtain a passage to the retina through the remaining unobscured parts of the lens. From the circumstance, however, of the pupil of the horse's eye being oblong, and the cataract, which forms from a central point, being globular—at all events for a time—contraction of the pupil will not, to that degree that it will when the pupil is circular, exclude the light; and this accounts for horses that have cataracts of this description seeing with them better than man and many other animals.

REMEDIES FOR CATARACTS save what consist in its removal by an operation, we possess none: the absorbability of cataractous deposits, either of the lenticular or capsular kind, yet appears exceedingly problematical; or, to say the most we dare in favour of it, yet lacks confirmatory cases.

AND TO THE PERFORMANCE OF AN OPERATION considerable difficulties stand in the way: although many or most of which by the ingenuity and skill of operators, have been surmounted, yet, after all, has little or no real good resulted from their laudable enterprises. The forcible retraction of the eyeball into the orbit the instant any instrument touches it, together with the simultaneous protrusion of the haw, will be found plaguy annoyances; and though instruments have been con-

trived to counteract these hindrances, yet is their employment apt to create a good deal of irritation and inflammation, and thus, after all, foil us in our best intentions. And not only at the time of, but even after, the operation, has the retraction of the eyeball been followed by prolapse of the iris ; or, worse still, bursting of the globe and escape of the vitreous humour.

FOR THE OPERATION TO PROVE SUCCESSFUL, other parts of the eye immediately concerned in vision will require to be in a sound or normal condition. Should the cataract have been the product of successive attacks of periodic ophthalmia, such can hardly be expected to be the case ; and, therefore, it would be fruitless to operate. In fact, the only case, strictly speaking, suitable for operation, is that wherein the cataract is of that description that has arisen spontaneously, or at all events, with so little concomitant disturbance that it is not likely other important parts of the eye have become anywise disorganized ; for, unless their impairment could be rectified, it is evident that all the good resulting from the operation must be nullified. Surgeons, I believe, in general, refuse to operate for cataract, unless the patient can, by certain sensations, distinguish light from darkness : perhaps this test with horses, would be somewhat difficult to arrive at. But, we will suppose that the eyes are in a condition for an operation ; and, further, that the operation has turned out, so far as the removal of the opaque lens is concerned, successful ; even then it does not follow that the animal is to regain his eyesight, or enough of vision even to be of any service to him. The eye, having lost its principal refractor and regulator—the crystalline lens—will require some artificial substitute. Eyeglasses supply this deficiency in man ; but, as has been before asked, could a horse be fitted, or have his eyes suited, with any sort of glasses ? And were this possible, still, would his restored vision be of a character to render him really safe and serviceable to us ? or would it be of that imperfect kind, converting him from a steady, sure-footed, trust-worthy servant, into a shy, mistrustful, dangerous creature, whom we could no longer confide in ?

The OPERATION.—Undaunted by any of these grave considerations, some veterinarians have been intrepid enough to

venture upon an operation for cataract. D'Arboval informs us that Dupuy, and that celebrated surgeon Dupuytren, have both essayed in horses to couch and comminute lenses, and in that manner procure absorption of the opaque body : but with no sort of success ; for neither could the lens, as in man, be effectually broken down, nor was it found to undergo absorption after the operation ; and, moreover, the inflammation occasioned in the eye by the attempts was of a nature to destroy the structure of parts that had, up to the time, remained sound. Tenon operated by extraction no less than eleven times, but failed, in spite of every precaution, in all his cases.

For the purpose of fixing the eye under the operation, various kinds of tenacula and specula have been invented by our ingenious continental brethren ; among which the instruments of Leblanc appear to be the most approved. And of the three modes of operating, viz., by *Extraction*, by *Displacement* (formerly called *Couching*), and by *Division*, Leblanc prefers displacement : indeed extraction he has altogether abandoned, as being an operation unsuited, on various accounts, to the eye of the horse. Simple displacement of the opaque body presents less difficulty in the performance, exposes the eye to less risk of accident, and is followed by less serious consequences than the other operations. We learn from D'Arboval, that both Beaucherc and Leblanc have succeeded by this simplest of the operations. Beaucherc assures us that several horses operated on by him recovered their sight. Leblanc operated on an Hungarian horse seven years old, on a one-eyed ass, on a blind ass, on a blind mare, on a black horse nine years old, on a three-year-old black mare, and on a horse from three to four years old, all of which had vision, more or less distinct, conferred upon them. Such success, however, has not attended all Leblanc's experiments. In fifteen other operations he failed ; attributing his failures to the internal condition of the organs with which his instruments came into collision. Gohier has operated on fourteen solipedes and one dog, by extraction, couching, and division of the lens. Five horses and one mare, subjected to extraction, did not recover their sight. Of five other horses, one female ass, and one bitch, couched, one horse in whom the lens remained couched, saw pretty well for several days after the

operation ; but ten days afterwards no longer could distinguish surrounding objects. The same thing happened to the ass, whose turned out a milky cataract. Another horse, whose cataract likewise was milky, and who saw sufficiently well immediately after the operation to direct his own steps, the following morning could not see at all. In one horse and one mare the operation of division of the lens was practised ; but it proved impossible, either before or after the displacement, to break up the lenticular body.

Gohier has, in few words, detailed the method of procedure for the operation of couching. The horse being cast and secured, and his head steadily maintained by an assistant, and the double speculum of Tenon used to confine the eyelids, while the cartilago nictitans has been retained by a blunt hook, the transparent cornea has been punctured with an oculist's straight knife, at the distance of a line or two from its circumferent border, on the outer side. The knife has then been carried through the aperture of the pupil upon the lens, and the lens depressed by it. To depress has proved easy ; but to keep the lens down, out of the axis of vision, extremely difficult ;* the moment the knife was withdrawn the lens rising again. The eye made no movement after it had become transfixed by the knife ; and so every opportunity was given to keep the lens couched as long as was deemed requisite.

Leblanc, however, must be regarded as our great authority and best guide in these matters. He uses a *bent needle*, with a plain or convex back and cutting sides, whose concavity describes the figure of two oblique planes, united in the middle by a line slightly salient, extending to the point of the instrument, the handle being turned in the direction of the convexity of the blade. A *simple, pointed stilette*,† is another instrument he employs ; a *small double-branched crochet* or blunt hook, a third ; an *elevator*, a fourth. For a description of these

* This arises from the elasticity of the compressed vitreous humour. On this account, that form of displacement which is called *Reclination*, which consists in a *turning over* of the lens into the middle and towards the bottom of the vitreous humour, is to be preferred to simple depression.

† A triple-branched or tricuspid stilette is very useful in the absence of an expert assistant.

several instruments, and for an account of his method of operating—in which he has followed the rules laid down by Scarpa—and for all other particulars, we must refer those who may feel disposed to experimentalise on this branch of veterinary surgery to Leblanc's *Traité des Maladies des Yeux*, a work replete with every kind of information on the subject.

GLAUCOMA.

GLAUCOMA—a derivation from the Greek word γλαυκός, signifying of a blue colour—is the term used in medicine to denote an unnatural green appearance of the interior of the eye. Human surgeons, acute observers in their own practice, are very apt, from ignorance of the structure and aspect of the eyes of animals, to suspect horses' eyes of being cataractous or glaucomatous when, in reality, they are perfect specimens of health: being deluded by the reflection of the *tapetum lucidum*.

The HORSE, it appears to me, is the occasional subject of glaucoma in one of two forms: either as an attendant or sequel of certain states or stages of periodic ophthalmia, or as an accompaniment of old age. D'Arboval denies that glaucoma is ever an especial disease; but regards it as one of the symptoms of periodic ophthalmia, or "some other ocular disorder."

The GLAUCOMA OF OPHTHALMIA is that recognisable change the eye undergoes in the course of the periodic disease which commonly goes by the name of *green cataract*: the aspect of the organ to the close and intelligent observer is such as to assure him that the case is not one of genuine cataract; for he can plainly see through the lens, changed in colour though it be, to the very bottom of the eye, the pupil the while remaining dilated, almost or quite insensible to light, and the organ altogether being in a state approaching amaurosis. The reflection from the bottom of the eye is not so much green as yellow, or rather amber-colour, a circumstance owing to the participation of the crystalline body in disease, together with

the vitreous humour. Under what especial conditions the eye under ophthalmia takes this glaucomatous turn—which still mostly ends in cataract—rather than proceed to the formation of cataract at once, I am not at this time prepared to explain.

The GLAUCOMA OF AGE is seldom to be discovered but in very old horses, and not in all instances among them. As age advances, the pupil, naturally sluggish in the horse's eye, becomes still more so; its contractions and dilatations, from the presence or absence of light, are less remarkable; in fact, become so tardy and inconsiderable as often to be unobservable. At the same time, the pupil is found to have acquired quite a grey-blue aspect, and in some aged subjects, in certain lights, will appear of a greenish hue. These changes are, no doubt, in part attributable to alterations in the consistence and colour of the lens; but the vitreous humour will, I believe, in most cases, be also found in an altered condition, a circumstance that authorises us to consider the disease as one of a glaucomatous nature.

The PATHOLOGY of glaucoma, in its pure or uncomplicated form, appears, from the observations of eminent human oculists, to consist in disease and ultimate absorption or solution of the hyaloid membrane, leaving the vitreous humour in the same unconfined fluid condition as that in which the aqueous humour naturally exists. It is thought, so far as disease is concerned in such a change, that inflammation is the producer of this; and veterinary observation appears confirmatory of this opinion. With the glaucoma of age, however, we apprehend inflammation can in no way be concerned. Sooner or later, in all cases almost, these changes in the lens and vitreous humour are succeeded by disorganization of the retina, rendering the eye less susceptible of the impressions of light; and, in the end, so little so as to make the organ appear, or really be, in a state of amaurosis.

REMEDIES FOR GLAUCOMA, the result of disease, are all, as a matter of course, merged in those for periodic ophthalmia. The glaucoma of age admits of no relief.

AMAUROSIS.

The faculty of vision, for perfection and enjoyment, is dependent upon *integrity*, as regards the component structures of the eye, and upon *susceptibility*, as regards the sensitive apparatus connected with those structures. The coats and humours of the visual organ may be all in a perfectly sound condition, and yet vision may be either impaired or lost, because the nervous appurtenances of the eye no longer possess the power of perceiving the rays of light, or, at least, of having those impressions made upon them which are necessary for the production of vision. This latter defect it is which constitutes *amaurosis*. The sight, either much impaired or quite gone, is said to be *ἀμαυρός*, obscure. The same disorder is also called *gutta serena*, and by common farriers, *glass eyes*, from the more than ordinary brilliancy the eyes possess, owing to the unnaturally dilated state of the pupils.

AN OBVIOUS DIFFERENCE between amaurosis as it ordinarily exists and other diseases of the eye therefore is, that in the one case there is nothing to obstruct the transit of the rays of light to the bottom of the eye; in the other, from obscurities of parts, from contraction or obliteration of the pupil, the rays are divided or intercepted in their course; and yet in both cases the effects, as regards vision, may be similar.

AMAUROSIS MAY PROCEED FROM some disease of the retina itself, in which form it is said to be *idiopathic*; or from some anormal condition of the optic nerve or the brain, or, according to Magendie, even of the ophthalmic division of the fifth pair of nerves, in either of which cases the disorder can be regarded but as *symptomatic*; or, lastly, it may prove the last link of a series of morbid phenomena originating in some remote part of the body, operating sympathetically on the nervous system, and through it extending to the eye; a case denominated *sympathetic* amaurosis. Of these species or forms of the disease the symptomatic is the one of most common occurrence in horses.

THE NATURE OF AMAUROSIS will vary with the nature and situation of the cause from which it originates. I have, in a former place, stated that now and then it is present in periodic

ophthalmia along with other changes induced by that inflammatory disease, and in particular with that which we have regarded as glaucoma: constituting what we may call *glaucomatous amaurosis*, and known by the wide dilatation of the pupil through which the posterior parts of the eye have a shining, glassy, amber, or amber-green coloured aspect. This appears a case in which the retina has suffered alteration of structure, and consequently one we stand no chance of remedying, unless we were in possession of a cure for the (periodic) ophthalmia itself.

SYMPTOMATIC AMAUROSIS, which may take its rise either within the brain or from one of the nerves proceeding from the brain to the eye, may generally be referred to *pressure*; either a tumour or something else is pressing upon one of the nerves, or, in consequence of congestion or inflammation or effusion, the brain is suffering compression. Sir Charles Bell, although he admits the pathological condition of congestion, dissents from the doctrine of supposed pressure being caused by it; arguing, that pressure has the effect of diminishing the supply of arterial blood to the sensorium, and in this manner deranges its functions, and causes amaurosis, and so forth. In the case of fracture of the skull, and consequent depression from a blow or fall, it is clearly pressure that is operative in the cerebral and nervous derangement; and the remedy as clearly is, the removal of that pressure. Cases of this description are by no means uncommon. The late Professor Coleman had a horse of his own who, from falling backwards, became hemiplegic and amaurotic on the opposite side of his body; for, in consequence of the decussation of the nerves, injury or disease of one side of the brain, as we know, produces loss of motion or sensation of parts on the other side of the body. By bloodletting and purging, and stimulants applied to the affected eye, the horse recovered.

ANÆMIA, DEBILITY, or want of blood in the body, and consequently in the brain, may prove the cause of amaurosis. M. Riss mentions the case of a three-year-old colt that was castrated by an itinerant gelder, and from secondary hæmorrhage became amaurotic. At the time he was called in, finding the blood still flowing from the wound in the scrotum, he had the

colt cast afresh, and after some difficulty succeeded in regaining the cord, around which he put a ligature, and besides, to make assurance doubly sure, plugged the scrotum with tow, and sewed up the external wound. Wine and a nutritious diet were prescribed, and all appeared doing well, when all at once it was discovered that the colt's sight was gone. Both eyes had become amaurotic, and every treatment that could be suggested failed in restoring them.

Another case the same writer relates, wherein amaurosis followed the sudden suppression of lactation in a mare, who for eight days had suckled her foal, owing to being allowed to drink heartily of very cold water at the time she was in a profuse sweat, immediately after coming off a journey. This case partakes of the nature of plethora or congestion.

Of SYMPATHETIC AMAUROSIS, one of the commonest causes in horses is gorged stomach, producing that fatal disease called stomach-staggers; and the curious circumstance is, that the amaurosis occurs not as a symptom merely, but often as a sequel of the disorder: it will come on one month, even two months, after the apparent recovery of the patient, and thus may, unless he be aware of it, deceive the practitioner into a belief that it is an original or independent affection. Several cases of this description stand on record. Girard, junior, in the *Recueil de Médecine Vétérinaire*, relates the case of a horse who was very subject to "vertiginous colics," a late attack of which, after eight or ten days, was succeeded by blindness, arising from complete amaurosis of both eyes; and this continued for two years afterwards, notwithstanding the horse remained in perfect health. M. Berger Perriere, in the same journal, for 1828, has also recorded cases in which amaurosis was not only a concomitant, but, in some horses that survived the attack, a sequel of stomach-staggers. M. Riss, in the memoirs before named, has detailed two cases, in one of which he succeeded in restoring the sight after he had been cured of his gastro-cephalic disorder, by blisters upon the cheeks, setons in the neck, and laxative drenches. In the other, which was that of a two-year-old colt, restored out of a fit of apoplexy to health and vigour, the amaurosis continued, in spite of all attempts to remove it. Mr. Youatt informs us, in his Lectures

in *The Veterinarian* for 1835, he has a perfect recollection of a case in which amaurosis occurred six weeks after recovery from staggers; and though he did not at the time discover their connection, it was evident enough to him afterwards.

Various other causes give rise to sympathetic amaurosis. In children, worms and dentition are influential ones. In horses, there are instances of the uterine functions so affecting the nervous system as to induce amaurosis.

M. Riss has, in the 'Memoirs,' published the case of a mare, nine years old, in an advanced stage of pregnancy, who became perfectly amaurotic in both eyes. Blisters were applied upon the cheeks, and for several days kept in a state of purulent discharge, and collyria were used. All failing, however, to do good, her owner was advised to suspend all further treatment until after parturition, the period of which was nigh at hand. Eleven days afterwards she foaled, and on the ninth day after the event, M. Riss saw her again, and found her vision restored. Her master told him she recovered her eyesight the day after foaling.

Another, a similar case, M. Riss narrates. The mare was seven years old, and near her time of foaling. The owner said she had always enjoyed good sight, but for the last five or six days she had been unable to see her way. M. Riss found her amaurotic. Recollecting the former case, however, in this one M. Riss refused to prescribe, relying upon the event of her *accouchement*. That occurred at the end of the week, and on the second day afterwards she recovered her vision.

AMAUROSIS VENENATA, a legitimate species of the disorder, both in man and horse, is that which arises from, or rather is at pleasure producible by, the application of narcotic poison, in particular of belladonna. Certain poisonous substances introduced into the system have likewise, I believe, the same effect.

The SYMPTOMS occasioned by amaurosis, and consequent blindness in both eyes, are too remarkable to be mistaken. The animal carries his head exalted, in what is called a "stargazing" position; and with his nose protruded and ears erect, if, unwillingly, made to walk, takes lofty, measured steps, evidently mistrusting the ground he treads upon, and fearful to advance lest he might encounter anything. Noise of any kind

alarms him : his ears are instantly set in motion to learn whence it proceeds. Such manifestations as these lead to an examination of the eyes. They are seen to have a ghastly stare ; the pupils are widely dilated, insusceptible to light, refusing even to contract when confronted with the glare of a lighted candle.

The pupils in amaurotic eyes are not always fixedly or even widely dilated ; they may prove only to an unnatural degree dilated, their motions rendered *sluggish* instead of being destroyed, and their contractions from light less in degree than in a state of health. Instances occur in man of the pupils of amaurotic eyes retaining their contractile powers on the application of light : I cannot say I have observed the same in horses. One eye may be amaurotic, the other remaining unaffected, in which case the pupil of the amaurotic eye does not become dilated to the same degree as when both eyes are paralysed ; and moreover, though insensible to the stimulus of light, the iris of the amaurotic eye may often be observed to move in a degree in concert with the motions of the sound pupil.

THE TREATMENT OF AMAUROSIS, too often an affair of hopelessness, must be varied in kind and application with the nature of the case. In retinal affection dependent upon the presence of periodic ophthalmia, we in vain apply any remedies save what tend to the removal of the ophthalmic disease. In amaurosis symptomatic of cerebral disease, our remedies must be directed to the head ; though, in that form which occurs as a sequel of cephalic derangement, benefit has been obtained from counter-irritation set up in the vicinity of the eye ; such as blisters upon the cheeks, setons through the nape of the neck, and so forth. In human medicine, benefit has resulted from making the blistered surface raw, and besprinkling it with a minute quantity, a quarter of a grain or so, of the powder of strychnine ; and we have Mr. Liston's authority, in his 'Elements of Surgery,' for saying that "the practice is very far from nugatory:" it would be worth our while to make trial of it. Among surgeons, also, mercury stands in high repute as a remedy for amaurosis, and, therefore, demands attention from us ; for as yet we are, I fear, in much ignorance of what is to be done for the diseases of horses by the exhibition of mercury.

WORM IN THE EYE.

The earliest veterinary account, I believe, published in this country of the extraordinary phenomenon we are about to consider, was that communicated to me, in June, 1825, by my relation, Mr. Charles Percivall, then veterinary surgeon to the 11th Light Dragoons, stationed at Meerut, in India; though in the year preceding this, Mr. Twining, surgeon to the commander-in-chief in India, had sent a paper on the subject to the Medical Society of Calcutta, which appeared in the Society's Transactions, and was thence extracted and published in *The Veterinarian* for 1828, together with a communication Mr. Twining received, after the reading of his paper, from Mr. Gibb, surgeon to the Honorable Company's stud at Poosah, who had not seen Mr. Twining's paper. This gentleman, from his situation at Poosah, where the climate was such as appeared favorable to the disease, had, during a residence of sixteen years, he thinks, on an average twenty cases annually; more, perhaps, than fell to the lot of any other individual in Hindostan. The same volume of *The Veterinarian* also contains an "Essay" on the subject in question from the pen of Mr. Molyneux, V.S., at present practising in London, which was likewise presented to the Calcutta Medical Society. In *The Veterinarian* for 1834, Mr. Skeavington, then at Devonport, and late veterinary surgeon to the Bengal Horse Artillery, favoured us with his observations, while in India, concerning this singular disease; since which a single case has been published in *The Lancet* for 1836, which occurred to Mr. Jeffreson, surgeon-oculist; and was, from that journal, transcribed into *The Veterinarian* for 1837. This I believe will be found to comprise all that has appeared in print, from original authority, on the subject of worm in the horse's eye; and to the authors of the several accounts hereinbefore named do we stand indebted for the knowledge we at the present time are in possession of concerning the curious phenomenon; myself being under especial obligations to those gentlemen, from being, through them, enabled to lay the following detail before my reader:

THE WORM IN THE EYE IS PLAINLY VISIBLE.—The intruder is clearly seen, in some instances even at a short distance off, swimming about in the aqueous humour within the anterior chamber of the eye, like—to use Mr. Jeffreson's simile—"an eel in a basin of water, apparently in the full enjoyment of its natural element," except at any time that it may happen to take a swim through the pupil to visit the darker regions of the posterior chamber; and then, for the time of its stay, it becomes, of course, invisible: and that it does, on occasions, take an excursion of this sort, we have the authority of Mr. Jeffreson, who asserts he has seen it "disappear, apparently behind the iris, and return again through the pupil." Mr. Gibb has, "more than once, seen *two* worms in the same eye at one time; and has, also, seen a second worm make its appearance in an eye from which one had been extracted some months before." Mr. Skeavington liberated a worm from the *near* eye of an officer's charger in September, 1831, and in September, 1832, the same horse was brought to him with a worm in the off eye.

THE WORM PROVES INJURIOUS.—His presence creates irritation. The eye shows it by becoming intolerant of strong light; lachrymous; the eyelids droop; the cornea becomes partially or completely obscured, sometimes assuming a nebulous aspect, rendering the pupil indistinct, or altogether invisible; nor can the worm, in consequence of it, any longer be seen, except at such times as it happens to approach the cornea. After a longer or shorter interval, inflammation arises in the internal and deep-seated structures of the eye, rendering the intolerance of light greater than it was at first, and extending to the conjunctival membrane, and there having the effect of suspending lachrymation. In some instances the conjunctival inflammation runs so high that red vessels may be seen traversing the transparent cornea.

THE WORM IS A SPECIES OF FILARIA, or thread-worm. It corresponds with the Linnean definition—"Corpus teres filiforme, æquali, ore dilato, labio subrotundo concavo. *Filaria equi*, habitat in equini corporis cavis variis, telaque cellulosa." According to Sir Everard Home, another species, the *strongylus*, has been detected in the horse's eye; of which the Linnean description is, "*strongylus equinus*. Capite opaco, intestine

nigro. Strongyli ovipari, hactenus non nisi in mammalium canali cibario reperti." Both the filaria and strongylus are thread-like worms, and without the aid of the microscope could not be recognised. Mr. Gibb has "never found the filaria except in the stomach and intestines of the horse, and in the eye;" and adds, he has never, as far as his recollection serves him, "seen a case of worm in the eye before October, or later than February or March;" the phenomenon being "exclusively confined to the cold months," and more prevalent in seasons in which the rains have been unusually heavy and enduring. The disease called *kumree*, or weakness in the loins, considered to be of a verminous nature, is likewise prevalent under the same circumstances. Mr. Gibb has "almost invariably found, in the stomach and intestines of the horse, worms exactly similar to those that are found in the eye, and in very great numbers, particularly in the cold months; also in tumours in the stomach, couched in thick mucus, but never in other parts of the body; never in the cellular membrane of any part, or in the canal of the spine; though he has often dissected, with Mr. Moorcroft, horses that have had *kumree*, or weak loins, with a view of ascertaining the cause of the disease. Mr. Molyneux has discovered worms, "similar to the filaria," within the intestinal canal, "as well as on the surface of the peritoneum;" and adds, "it does not appear that any part of the peritoneum is exempt from them."

A worm extracted by Mr. Skeavington, examined without the aid of a glass, appeared of the magnitude of a middle-sized sewing cotton, and was nearly three eighths of an inch in length, and exhibited a black speck at either end. Another worm, which while in the eye appeared flat and with edges "fringed like a saw," proved afterwards to have been dead, and ultimately became absorbed. A worm liberated by Mr. C. Percivall "measured one fourth of an inch in length, was about the size of common sewing thread, perfectly white, and pointed at both ends. Viewed through a microscope, it resembled a piece of catgut; and there were three luminous marks distinguishable upon one end of the body, supposed to be the head; and farther backward, an irregular luminous patch, from which two brilliant lines ran parallel, direct to

the opposite extremity." Another worm extracted by Mr. Percivall was both "larger and longer" than the former.

TO ACCOUNT FOR THE PRESENCE OF THE WORM IN THE EYE, Sir Everard Home informs us that the *Filaria Equi* are found in the circulating blood of the horse; and that he is disposed to believe that they get into the aqueous humour through the arteries of the ciliary processes, which in the horse are of comparatively large caliber; an opinion favoured by the notorious fact of worms being often discovered within the cœliac artery of the ass; though these appear to be of a different description from—certainly of greater magnitude than—any that have been found in the eye. Mr. Gibb is of the same opinion as Sir Everard: "I have always been disposed," says he, "to think that the worm in the eye must find its way through the circulating system, and not from without." It is now well enough known, that worms have been discovered in various parts of the bodies of animals, besides within the stomach and intestines. Naturalists have described several species—the ascaris, tænia, filaria, strongylus, ligula, &c., as inhabitants of the bodies of the horse, the ox, the sheep, the hog, the deer, &c., and "several circumstances concur," says Mr. Twining, "to render it probable that the ova of the filaria equi are received into the stomach with the food; and these ova being taken up by the absorbent vessels, pass by means of the circulation to different parts of the body favorable to the development of the worm; and that having taken place, their further progress may be impeded by their increased size."

BUT HOW DOES THE WORM ENTER THE BODY? Is it bred therein? is the ovum or the animalcule itself taken in with the food, or with the water, or, like the ovum of the bot, is it licked in by the tongue? We learn from Mr. Skeavington, that the disease is exclusively "peculiar to India:" from inquiries he made of several Arab merchants, he was informed it was not known either in Arabia or Persia. Mr. Gibb says, to him the presence of the worm appears to be owing "to climate and situation more than to any other circumstance, and to have connexion with particular seasons of the year;" and that he had no cause for believing "that any particular description of food or water is productive of the disease." But, as

Mr. Skeavington has properly remarked, it is by no means evident "how the humid atmosphere, the low situation, the fog, the wet, or the cold, can produce worm in the eye;" especially as horses in India are always kept in the stable; Mr. Skeavington's own opinion being, that "the worm is taken up at the time of drinking, in so minute a form that it is capable of being absorbed; the water in India being supplied through immense ponds or tanks, filled by deluges of rain" during the wet seasons; hardly any of them having springs. Mr. Skeavington, in the course of his anatomical studies, has found worms "in almost all the passages;" he recollects finding "an immense quantity within the trachea of an ass, and within the bronchial tubes;" and in the same subject, encysted in small tumours, the size of peas, within the colon, cæcum, and rectum, worms resembling ascarides; some of them minute enough to bear a comparison to "dust shot."

The REMEDY FOR WORM IN THE EYE consists in an operation by which liberty is given, and death as the consequence, to the disturber of the health of the visual organ. Supposing no operation is performed, the usual result according to Mr. Gibb is "opacity of the transparent cornea, and subsequent loss of sight of the eye." In some instances in which opacity did not take place, the worm was observed to be weakly, "sluggish and feeble in its movements," and soon died, and became absorbed: hence the reason of the eye "remaining clear." In such cases Mr. Gibb "made it a practice not to operate."

The OPERATION is a very simple one. It consists in merely puncturing the cornea with a common lancet, and giving exit to the aqueous humour, the worm being expected to float out along with it. Mr. Gibb's mode of operating is this:—He never finds it requisite to cast the horse, nor to use any means to fix the eye: but, with his left hand, raises the upper eyelid, while an assistant depresses the lower one; and then, watching his opportunity, punctures the cornea behind, and about a line's breadth, or a little more, from its junction with the sclerotic coat. At the time the puncture is making, he presses the eyeball with his left hand, and thereby causes the aqueous humour to spirt out with greater force, thus affording more certainty of the escape of the worm,

It being an affair of some consequence, that the opacity consequent on the cicatrix left by the puncture should not be in a situation to interfere with useful vision, Mr. Molyneux thinks the operation ought to be varied, in respect to the place chosen for puncture, according to the kind of horse, or to the purpose for which the subject is likely to be used. Draught horses, not requiring vision backward, might have the incision made through the supero-posterior part of the cornea; saddle horses, on the other hand, through the superior part. And the instrument Mr. M. has generally used is "a trocar of the smallest size, having a little tow rolled lightly around the perforator, leaving about a twelfth or fourteenth of an inch of its point naked." Mr. M. finds the cicatrix less after a puncture of this description than after lancing. Mr. M. casts the horse for the operation.

Mr. Skeavington, like Mr. Gibb, operates on the horse standing. He punctures the *central* part of the cornea; alleging that, by so doing, he not only avoids all risk of wounding the iris, but ultimately leaves the eye *without* blemish: there being, according to his observation, always more or less opacity caused by the lateral operation.

AFTER THE OPERATION it is sometimes requisite to abstract blood, either topically or constitutionally; always to purge: and the best application to the eye appears to be a compress soaked in cold water. Should any deposits or opacities remain after the subsidence of the inflammation and union of the cornea, stimulating collyria, &c., may prove useful.

SEQUELÆ.—Mr. Gibb informs us he has been very successful in his operations; and so perfect have they in many instances proved, that no one could discover where the incision had been made. In other cases, however, "a considerable speck" has remained, and in some few, opacity has become permanently established, notwithstanding every nicety and care have been used in operating. In one of Mr. C. Percivall's cases an opacity followed the incision—made with a *small* lancet through the postero-inferior part of the cornea—of the dimensions of a sixpence, which in spite of "a variety of applications" remained undiminished for several weeks afterwards. The horse was in consequence sent to his regimental duties; and while there,

the opacity gradually and slowly lessened to a degree that, nine months afterwards, it had decreased half its original dimensions.

It has happened that the worm has not made its escape with the aqueous humour; and in consequence, a second operation has become necessary, after giving time for the reunion of parts and the fresh secretion of the humour. As Mr. Molyneux has pertinently observed, however, the worm might after the first evacuation—and would, I should imagine, be very likely to—“die within the eye,” and which he tells us “often happens;” and then it will, “like any other foreign matter, become absorbed.” Still, Mr. Gibb informs us that, repeatedly, the worm has survived, and for its extraction has required “a second operation.”

FUNGUS HÆMATODES.

The formidable disease to which the appellation of *fungus hæmatodes* or bleeding fungus, was first given by that celebrated surgeon, Mr. Hay, of Leeds, is also described by others under the appellations of *spongoid inflammation*, *medullary sarcoma*, and *soft cancer*.

Though hardly any part of the body can be said to be insusceptible of it, the parts in which it has been most observed are the brain and the testicle, and, above all, the eye. It has likewise been seen in the mammæ and in the extremities, and in the walls of the heart.* Many cases stand recorded of persons suffering and dying from dreadful inflictions of this nature; but, fortunately for us, and still more for our patients, the brute creation affords but few and rare instances of it. This has enabled surgeons to frame an account of the disease comprehending the features of the generality of cases, as they commonly present themselves, and such a one as may, as an outline, prove useful to us; and, therefore, I shall transcribe it, selecting, as the best I can find in relation to the eye, that given in the excellent work of Dr. Mackenzie.*

SYMPTOMS.—“The disease arising within the eyeball pre-

* Dr. Mackenzie's ‘Treatise on the Diseases of the (Human) Eye.’

sents three stages—In the first stage the exterior form of the eye is unchanged. The disease is perceived through the cornea and pupil; the latter being dilated and immovable, and behind it, the vitreous humour having a shining yellow appearance. By and by, this bright reflection attracts more attention, and is evidently arising from the presence of a solid body at the bottom of the eye, which slowly advances towards the pupil. As it advances the tumour presses the vitreous humour and crystalline lens before it; the former is absorbed; the latter presses, in its turn, the iris convexly forward. By and by, the lens becomes opaque, and is generally absorbed. Still advancing the iris is pressed against the cornea.

Second Stage.—The cornea rapidly expands to, perhaps, double its natural diameter. The eye grows knotted at one or more places. The white tumour, covered by thin conjunctiva only, now feels soft, and might be mistaken for a collection of pus, and so opened. If the lens had not previously been absorbed, it is now discharged.

Third Stage.—The tumour, protruding through the ruptured cornea and sclerotica, forms with great rapidity, so that it is no longer capable of being covered by the eyelids. It assumes the appearance of a dark-red fungus, irregular on its surface, soft, readily torn, and bleeding profusely on the slightest irritation. Clots of extravasated blood form in the interior of the medullary mass. Extravasations, indeed, of this kind are apt to supplant almost the whole of the medullary matter; so that the name, *fungus hæmatodes*, becomes more appropriate. Portions of the tumour die, blacken, and slough off from time to time, but the general bulk of the fungus is not at all reduced; on the contrary, it increases so as to distend the eyelids to an enormous degree, and even to dilate or destroy the orbit; while the portion which projects from that cavity, and overhangs the cheek, sometimes exceeds the size of a man's fist.

“The lymphatic glands of the cheek and neck become enlarged, sometimes to a very great extent. In some instances the opposite eye is protruded from its socket.

“The patient becomes affected with great constitutional irritation.

“The DURATION OF THE DISEASE is very variable.

“The APPEARANCES ON DISSECTION are very far from being uniform; they may all, however, be referred to the effects of a medullary growth from the optic nerve.”

This general description of the characters and progress of the disease, as it invades the eye of man, will be found in most respects applicable to the same disease in the horse's eye. The following case, contained in *The Veterinarian* for 1835, pronounced by a surgeon, whose opinion was sought concerning it, “to bear all the specific characters of the disease in the human subject,” will, I think, fully warrant me in making this assertion, at the same time that it affords a striking instance of the great assistance we may on occasions receive from our sister science—medicine:

Mr. Godwin, V.S., Birmingham, “was requested by J. Walker, a farrier in Lichfield, to see a case for him which he had been attending, viz., ‘a mare (to use his own words), out of whose near eye some proud flesh had grown, until it had turned the eye inside out.’ He had, at different times, ‘cut and causticked some pounds away; but it grew as large as ever again in a very short time, and bled a good deal whenever it was touched.’

“I went with him, and found a fungoid tumour growing from the near orbit; soft, but resuming its shape after the removal of pressure, and bleeding considerably after examination. Upon inquiry, I learned that the tumour had existed five or six months; but she had been blind of the eye affected several months previously to the appearance of the tumour. The ball of the eye, in the first instance, was noticed to have become considerably enlarged, and this increased until the cornea burst, when a small vascular tumour protruded, forcing before it the contents of the sclerotica, and distending this tunic to such an extent as to cause the farrier's assertion of the ‘eye having been turned inside out;’ a description of the case not so inappropriate as, in the first instance, it appeared to be. From this period it grew in size rapidly: portions of it had been removed several times by different means; and her health had continued pretty good until within the last few weeks, when the bleeding had become more considerable, and she

exhibited, by coma and other symptoms, indications of the brain having become affected. Judging from the appearance of the tumour, with its disposition to bleed so profusely, and the fact of its having been formed in the interior of the eye, I concluded it was not of an ordinary description ; and, suspecting it to be a case of fungus hæmatodes, I requested Mr. Allport, surgeon, residing in Lichfield, to see it with me, who pronounced it to bear all the specific characters of that disease in the human subject.

“I had previously determined upon extirpating it with the whole of the contents of the orbit, and which was now effected. I found it necessary, in consequence of the superiority in size of the tumour to that of the orbit, to dissect a portion of it away level with the orbital margin, before I could make it practicable to remove that which was contained within the orbit. With some difficulty, owing to an immense hemorrhage, the whole was extirpated, weighing about two pounds. The sclerotica within the orbit was filled with firm medullary matter, of a yellowish colour ; the optic nerve had its usual appearance, but there was no trace of any of the other component parts of the eye. The portion that was first dissected away had a somewhat similar though darker appearance towards its centre, and became very vascular towards its exterior. The orbit was filled with tow after the operation, and a bandage applied to retain it. The mare had physic, and was sent home.

“I saw her two days afterwards, when she was swollen pretty much about the parotid gland and top of the head. These parts were fomented, and physic was given, which operated well. I did not see her again, but understood from the farrier who attended her, that the swelling increased until about the seventh day after the operation, when the comatose symptoms became more apparent, and she died in three weeks from that time. The tumour was larger than it had ever been, which appeared more extraordinary, as I considered that I had removed the whole of the tunic from which it had originated. He opened the head, and found the brain very soft, and containing much serous fluid.”

M. Crepin, Paris, has related a case in the *Journal Vétéri-*

naire for 1835, in which a disease, having the character of fungus hæmatodes, commenced in the membrana nictitans, and extended afterwards to one parotid gland, and to parts about the under jaw.

The mare was eighteen years old, and had had for many years an ulcerated tumour on the membrana nictitans of the right eye, but which did not prevent her working. Almost imperceptibly, in the course of years, it had grown to the size of a pigeon's egg, and nearly covered the eye. Sanious pus ran from its prominent point, and mixing with the tears streamed down the cheek. By great persuasion, M. Crepin prevailed upon her owner to let him operate upon her.

On the 11th February, 1831, M. C. cast the mare, passed a thread through the tumour, drew it out of the eye, and cut it off with a pair of curved scissors, leaving remaining nought but the cartilage from which it had grown. The mare returned to work on the fourth day afterwards, the only inconvenience remaining being relaxation of the lower eyelid, which, in time, was removed by cold bathing.

From the earliest development of the tumour there had been apparent a glandular substance underneath the jaw, which had slowly increased, and at the period of the operation had reached the magnitude of a nut, and was exceedingly hard.

The eye continued well until the following August, when there appeared at its angle a new vegetation like a small pea, which grew, and in time again covered the eye entirely, and considerably distended the lids, and could be felt below, extending towards the bottom of the orbit.

On the 20th February, 1832, M. Crepin extirpated this fresh growth. He experienced more difficulty than before, on account of numerous adhesions between the tumour and surrounding parts. He succeeded, however, in isolating and excising it without doing any mischief. The animal did not seem to suffer much, the operation being all over in little more than two minutes. The immediate consequences were of no moment; there remained a little purulent discharge from the angle of the eye. On the eighth day the mare returned to her work.

But the tumour underneath the jaw had increased consider-

ably; it now filled the submaxillary space, and even projected beyond the branches of the jaw. It was still hard, and the skin upon it tense and adherent. Being neither painful nor, as yet, troublesome, it was let alone. In the eye, however, a month after the last operation, a new vegetation occupied the same spot as the old one, and was of the same nature. It grew as the other had done, and in five months again was the eye completely covered. Then again, by now the submaxillary tumour had become enormous, and was comparable in hardness to a stone. It interfered with the motions of the tongue and with deglutition.

A double operation was now become necessary: M. Crepin solicited the aid of M. Pagnier, V.S., Gardes du Corps, and MM. Philippe and Leon, V.S. Second Dragoons, who obligingly attended on the 11th of September.

After having made a longitudinal incision through the skin, underneath the jaw from the throat almost to the submaxillary symphysis, M. Crepin dissected carefully past the flaps, and made an effort to isolate the tumour, by detaching it from its adhesions, partly with his fingers and partly with the bistoury. He succeeded in raising it in one mass, which weighed 1 lb. 13 oz. He apprehended opening the parotid duct. He was also close upon the internal maxillary artery. He tied both vessels. After all, he found himself compelled to open the duct.

There remained two gangliform tumours, the larger of which, the size of a pigeon's egg, lay against the bifurcation of the jugular, and sufficiently deep to make M. Crepin fear lest he should wound the carotid artery in removing it: the other rested on the side of the larynx. Emboldened by the advice of M. Leon, he used his bistoury, and at length extirpated these tumours and some smaller ones in the vicinity, without dangerous hæmorrhage.

The tumour of the eye, now become as large as a hen's egg, proved difficult to remove. It adhered to the caruncle, lower lid, and sclerotic coat, and had buried itself under the eye. Of the triple operation, this, M. Crepin found the most difficult. At length, however, he succeeded without even injuring the caruncle.

His first dressings were tow and cold water, succeeded by two or three sutures, and confined by a long figure of S bandage, as recommended by Lafosse for cataract.

In the course of the healing process, which went on well in the neck and eye, the parotid duct got opened, and for a time baffled all M. Crepin's efforts to close it again. Cauterization at last proved effectual.

The mare went to work before the wounds were healed, everything appearing to be doing quite well, when, scarcely were the wounds closed before new morbid productions began to form under the cicatrices; and, in May 1833, the evil had become as great as ever. Ever since the last operation there had remained on the cornea, near the nasal organ, a fleshy growth of the magnitude of a lentil. This rapidly and extensively spread, and covered a great part of the eye, and in the end projected beyond the lids, preventing them from closing. Its extreme parts were continually emitting blood, and great pain was occasioned by the continued injuries to which it was exposed. For this reason, and others of a humane kind, the mare was delivered over to the farmer, who promised to treat her kindly, and not work her hard. Shortly afterwards she quite suddenly turned out a roarer, to a degree to threaten suffocation on the slightest exertion. Her sufferings were at length terminated by a single blow; it being considered the greatest happiness to her, in her present state, to die without the knowledge of it.

POST-MORTEM APPEARANCES.—The superior portion of the trachea was found farcied, with masses of different volumes communicating with each other by a dense fibrous tissue. These tumours were formed of an exterior envelope of white, fibrous, cellular tissue, enclosing a scirrhus structure tending to an encephaloid nature; some portions being hard and white, the remainder of a yellow colour, and of a less firm consistence. A mass of tumours abutting against the upper part of the trachea had caused it to bend to the left side, and had penetrated between the ligaments of the tube as low down as the fifteenth ring. The whole of the tumours weighed at least five pounds. The parotid gland had diminished a fourth of its natural volume, and its glandular structure was changed into

an indurated cellular tissue, beautifully white. No traces of the parotid duct could be discovered, except at its place of origin, and there existed a cavity large enough to hold a pigeon's egg, containing a turbid fluid, like decomposed saliva.

The submaxillary lymphatic glands had disappeared, had seemingly become transformed into scirrhus tumours.

The right lachrymal caruncle was the size of a pigeon's egg, scirrhus, and encephaloid like the other tumours. At the larger angle of the eye (the outer) there was a similar growth, of the volume of a nut, having its base, which was its largest part, supported partly by the cornea, partly by the sclerotica. These two membranes of the eye, however, did not in themselves appear diseased. A mucous membrane covered the tumour: its roots also consisted of sub-mucous tissue. The interior of the eye proved sound. The eyelids had increased in substance.

Such is the history of fungus hæmatodes in one of its most dreaded and uncontrollable forms. In M. Crepin's trying case, the direful foe had not long been uprooted from one place before he was seen rising up in another; or else with revived energy and more terrifying aspect appearing anew in the very spot from which he had been last dislodged, never, as was but too fondly hoped, to show his face again. Anomalous and incomprehensible disease like this baffles all and every remedy art can devise to oppose it with. We may succeed in keeping the destroyer for a time in abeyance; but in the end he will, in spite of us, consume the heart's-blood of his victim.

OSSIFICATION OF PARTS OF THE EYE.

It is an opinion entertained by the best surgeons, that osseous deposit is not only at all times the result of inflammation in some form, kind, or degree, but that inflammation, long continued or frequently relapsing in almost any part, is very apt to leave some unnatural formation of osseous substance. The eye is certainly no exception to this general law: the cornea, the choroid coat, the retina, the anterior and posterior chambers, the crystalline lens and its capsule, have all,

at one time or another, been the seat of ossification ; and in almost all these cases we shall find that the forerunner of the ossific change has been periodic ophthalmia. In horses who have experienced attacks of this disease, inordinate in violence or duration, or in number, and who have many years survived the termination of them in total blindness, and consequent atrophy of the blind eye or eyes, we may search for, and expect to find, specimens, of some kind or another, of ossification.

Mr. Swarrick, V.S., Skipton, Yorkshire, in examining the eyes of a blind mare who had died from rupture of the posterior aorta, found the crystalline lens of the near eye of a cartilaginous texture and not adherent to its capsule. And of the off eye, though the anterior chamber was full of aqueous humour, the posterior chamber was "filled with an osseous deposit, giving a pitted appearance to the part."

Mr. Cartwright accidentally met with a case of ossification in the eye of a donkey. "The sclerotic coat appeared healthy, except that a circle of bone existed near the optic nerve. There did not appear to be disorganization of any other part of the eye."

Mr. Charles Percivall, as I mentioned in a former place (at p. 87), has in his museum a preparation showing ossification of the retina.

Besides these and other cases of the kind on record, there will, in almost all veterinary museums, be found specimens of various descriptions of ossification of parts of the eye.

MELANOSIS.

Professor Rodet discovered a remarkable kind of melanosis in one of the eyes of a horse. The space usually occupied by the vitreous humour was filled with a fluid as black as Indian ink, in which floated equally black clots. The crystalline lens was of a deep yellow colour, and in some parts even brown.*

* For a good account of melanosis, consult Andral's 'Treatise on Pathology of the Eye,' translated by Drs. Townsend and West.

LACERATION OF THE EYELID.

This is by no means an uncommon accident. By a bite from a horse standing in the next stall, or from hitching the lid upon some nail left projecting in the head-boarding or side-lining of the stall, every now and then a horse gets the external or ciliary border of the upper eyelid, the part from which the eye-lashes are growing, torn from the broad expanse of the lid, and left hanging by a slender portion of skin from the outer angle of it : the laceration commonly commencing from the inner, superior, and most projecting part of the lid, though sometimes the reverse is the case. In this lesion, the ligamento-cartilaginous substance, called the *tarsal cartilage*, to which the eyelid owes its form and consistence, is torn through : the thickest and firmest parts of it being incorporated in the ciliary border ; the remainder being retracted by the *levator palpebræ* muscle, with which its fibres are inseparably intermingled. In general, for so small a wound, there is a good deal of hæmorrhage ; and it is an accident that commonly, to an unprofessional man, assumes an appearance of an awful nature. Fortunately, however, for the veterinarian, it is one by which, with a little dexterity and attention, he may often acquire considerable credit for his surgery.

The TREATMENT consists in the accurate approximation of the lacerated parts, as nearly as possible in their natural juxtaposition, by suture. First, cleanse the eye from blood ; and then, the horse being twitched, and having his head secured and steadied by assistants, with a small, sharp, crooked needle, armed with a double ligature of strong sewing silk, neatly and securely stitch the severed portion to the body of the eyelid. The interrupted suture is the one, perhaps, best suited to the case. As soon as complete cohesion appears to have taken place between the wounded parts, certainly not before, or when purulent matter is seen oozing around the edges of the stitches, the sutures may be divided and withdrawn : this will not be in less than a week ; it may take a longer time.

A very important part of the treatment—that without

which all the pains we may have taken in the application of the sutures may turn out to be completely frustrated—is the precautions to be taken to prevent the patient from disturbing, fretting, or dissevering the wounded parts again, by rubbing his eye against some part of the stall, rack, or manger: an act he is almost certain to commit, urged to it by the irritation and annoyance the sutures are likely to occasion him. The surest plan of procedure is to confine his head with a double rope, running through or attached to rings affixed to the posts of the stall-boards, on either side, so far back that he cannot reach either rack or manger with his head, or make any attempt to lie down. In this pillared position, fed out of a hay-basket or box placed, at feeding-times only, before him, he is to be kept until the eyelid is quite adhered and cicatrized. Even after this, on being liberated, I have had horses that have, vexatiously, rubbed and excoriated or severed afresh the healed-up parts. One patient served me this trick three times, and in the end forced me to deprive him of a portion of his upper eyelid: thereby rendering his eye continually tantalised by light, producing frequent nictitation, and occasional lachrymation, and in time likely to bring on internal disease.

ENLARGEMENT OF LACHRYMAL CARUNCLE.

Major B——, of the Guards, brought his charger to me for “a swelling at the inner side of the eye.” I found it to be, what I had never seen before, an enlargement of the lachrymal caruncle. It was about the magnitude of a large pea. My advice to the Major was, that he had better let it alone: it neither interfered with vision, nor with the course of the tears; and any attempt to remove it might do harm, by proving an excitant of inflammation in the eye, or might be followed by “a watery eye.” The horse, in accordance with this advice, was taken away; but at the end of five or six months, returned to me with the caruncle as large as a marble, and certainly, from its redness as well, appearing now to amount to a very objectionable appendage: still, nowise molesting vision or the entrance of the tears into the *puncta*. However,

the Major had made up his mind that the preternatural growth should be got rid of; and, therefore, the question now arose, what measures were to be taken for the purpose. I showed the case to my excellent friend, Mr. Youatt, who agreed with me that, of the various modes of operation which appeared appropriate, *caustic*, *excision*, *ligature*, the latter seemed the simplest, and on that account the preferable proceeding, and accordingly, ligature was adopted. I deemed it my duty, however, before operating, once more to warn the Major of the risk we ran of inflammation in the eye, and that for what the consequences of that *might* be I could not hold myself responsible; at the same time I candidly confessed to him I had no strong reasons to be very apprehensive about the event.

The horse, after due preparation by regimen and physic, was operated on in August, 1836. The tumour, having a narrow neck, growing from a slender pedicle, was easily encircled with a doubled strong silk ligature, which was drawn moderately tight. The second day afterwards, the tumour had acquired a livid hue; the ligature was tightened. The fourth day, the tumour appeared darker coloured and shrunk; the ligature was again tightened. The sixth day, tightening of the ligature dissevered the tumour, and it fell off. I ordered another dose of physic, and fomentations and simple astringent collyria, and everything until the twelfth day seemed going on well; but on this day there appeared some considerable injection of the conjunctiva, accompanied by a dim lustreless aspect of the cornea. Next day, this dimness had increased: and the day after, the entire cornea had become white and perfectly obscure from interstitial deposit. Bloodletting, both general and local, was practised; strong cathartic medicine was given; and fomentations were used, in accordance with the exigencies of the case; but all availed nothing; the eye remained completely obscured, and my worst predictions of the liability of the eye to an attack of inflammation from such an operation seemed to be fulfilled. I had no resource left but mercury. I ordered a drachm of calomel to be given in a ball every morning. About the ninth day the gums had become tumid and reddened, and the breath affected with mercurial fœtor. The medicine was discontinued. The day following the horse cuddled his hay;

after masticating it, he put it out of his mouth again, amassed into pellets. A few days after this effect of the mercury, the cornea began to lose its white aspect, and in places to show signs of becoming bright again. In short, from this time amendment commenced, and progressively spread until every part had regained its wonted pellucidity and healthfulness ; the horse, now old, continuing up to this day, I believe, in the enjoyment of his full vision.

FISTULA OF THE EYE-PIT.

Of this singular affection I never saw a case myself : but there stands one on record, and one of a truly formidable description, that occurred to M. Merle, of Pézénas, who has related it in the *Journal des Vétérinaires du Midi*, from which it was translated into *The Veterinarian* for 1839.

“ On the 21st of May, 1830,” says M. Merle, “ I was desired to examine a bay horse, six years old, that during the last fifteen days had fed with considerable difficulty. It had a large tumour, which occupied the space between the eye and the forehead on the left side. I determined to lance it at the spot corresponding with the pit of the eye, and a great quantity of the spikes of brome-grass (*Bromus hordereceus*) immediately protruded. I cleared them away, and threw in some detersive injections ; but, on account of the direction of the fistula, neither the injected fluid nor the suppurative matter could escape, and it was necessary to absorb them by means of a piece of sponge. I, however, assured myself of the depth of the fistula by means of a gum-elastic sound, which, being introduced above, was gradually pushed into the cavity of the mouth. I then passed a straight sound, which I brought out at the right commissure of the lips. I attached to one end of this probe a long piece of tow, terminating in a point, and moistened with tincture of aloes. With some management I introduced it into the whole of the fistulous passage.

“ On the following day we removed this pledget, in order to introduce another, charged with an active digestive ; but in the

act of mastication it got between the molars, and was broken, and it was necessary to renew it every two or three days. If we neglected this, the pit of the eye would again become filled with that by which it was before distended ; the animal would be sadly inconvenienced by it, and refuse to eat. During a month, the fistula was dressed in this manner, namely, by the occasional introduction of fresh pledgets of tow. Finding the inconvenience that resulted from the passage of the seton into the mouth, I attempted to give it a new direction. I passed the elastic sound into the pit above the eye, and, pressing lightly with my right hand, while I held my left under the angle of the lower jaw, I began to feel the end of the sound at the superior part of the channel. I then determined to pass my probe in this direction ; but, as I had not the instruments necessary for the operation, I postponed it until the following day.

“ The morrow having arrived, I took a long seton-needle, but not so large as the sound of which I have spoken. I covered the cutting edge of the needle with several layers of wax, until I had made it for the time a simple sound, that would not cut for itself any false route. The horse being ready, I sounded him again, in order to be assured of the direction which I ought to take ; and as soon as I had withdrawn the sound, I passed the needle in precisely the same course. When I began to feel it in the channel between the jaws, I pressed it with some force, and it penetrated through the skin, leaving the wax in the wound. I prolonged the opening longitudinally, and fixed anew my seton in this artificial fistula, having first dressed it with weak spirit, and afterwards with digestive ointment. The animal lost some blood in the operation, but he did not suffer much during it, nor was he seriously inconvenienced afterwards.

“ I thought that the seton passing this way would not be torn by the teeth ; but I was deceived. It suffered the same fate as that which terminated in the mouth.

“ I then took an annealed metallic wire ; I surrounded it with tow, and passed it through the same fistulous opening. In this way my object was at length accomplished, and the fistulous canal was closed. I every day threw detersive injections into the wound, and replaced fresh tow around the wire. The horse now began to eat without difficulty, and acquired condition.

“The bad smell which was exhaled from this ulcer made me think that there was caries of the sphenoid bone. I cauterized it, and, in order to reach the bone without injuring the surrounding parts, I passed my cauter, at a white heat, through a metallic tube. By these means the fistula became considerably enlarged, and the lotions and injections were more easily applied.

“About a year after this metallic wire had been adopted, I chanced to see the animal again. When it drank, a portion of the water escaped through the fistulous opening: a portion of the food likewise followed the same route, and frequently obstructed the passage. Then, when no water could ascend or pus descend, the horse lost his spirits, and would not eat; but when a sound was passed, and water with a small portion of spirit added to it, was injected, the animal's spirits and appetite immediately returned.

“Thus he continued for another twelvemonth. He was constantly used, and did his full share of work. Some of the water, as he was drinking, escaped through the pit above the eye. Beyond this he did not appear to be incommoded by the fistula. I attached a large piece of copper to his head-harness, in order to prevent any foreign bodies from entering or falling into this chasm. I saw him often, I rode him when I wanted him, and in 1833 he was given to the hospital of Pézénas, where he was employed in turning a rude kind of mechanism, for the purpose of drawing water for that establishment. He is there at the present moment (1838). The hollow of the pit is now enormously increased. It is become infundibuliform, and it will hold more than half a pint of fluid. The skin is considerably distended there, and clings to the bone, in proportion as the adipose body, which should naturally occupy this cavity, is wasted away. There is no other wound than the canal which penetrates into the mouth. Notwithstanding all this disease in its immediate neighbourhood, the eye is not in the slightest degree injured.”

DISEASE OF THE LACHRYMAL PASSAGES.

This malady, familiarly known as “a watery eye,” only now and then occurs in horses. I may have met with some half a dozen cases of it in my time; some or all of which might have been, in days gone by, called *fistula lachrymalis*: an appellation which surgeons, better informed, of the present day, properly confine to a form or stage of the disease, that I cannot say I have ever had occasion to treat in my own practice. The lachrymal apparatus in animals is little subject to be out of repair. Its comparative simplicity, the larger size of the passages and apertures, and the little irregularity which happens in the lachrymal secretion may serve to account for this.

In horses there seem to be three causes from which the tears, instead of pursuing their natural course, may overflow the under eyelid and trickle down the face. One is, an increase or superabundance of secretion; and this may arise either from some external cause of irritation, or, what is commonly the case, from the presence of conjunctival inflammation: hence the escape of tears upon the face becomes one of the symptoms of ophthalmia. A second cause is, tumefaction of the eyelids, occasioning diminution of the *puncta lachrymalia*, as well as, perhaps, interfering somewhat with the regular course of the tears into them. A third, and the grand cause,—it being the one we are to regard as constituting the disease of which watery eye is the sole or especial symptom,—is obstruction in the lachrymal passages. The nature of this obstruction, so far as our operations to relieve it have enabled us to judge of it, appears to be similar to what constitutes a stricture in the urethra in man, viz., a thickening of the lining membrane, in some part of the passages, in consequence, as it would seem, of some prior or existing inflammation. That this membrane, which is of the mucous class, appearing indeed to be a continuation of the conjunctiva, is not infrequently inflamed, in its course through the *puncta* at least, we may adduce as evidence the globule of mucus so commonly seen lodging upon the *puncta* in catarrhal and other inflammations about the head; and if

so often inflamed within the *puncta*, no doubt, on occasions, it becomes so through its whole course. The common seat of obstruction, so far as our very limited observations warrant an opinion, appears to be the superior part of the *ductus ad nasum*; or it may, according to D'Arboval, be the *lachrymal sac*.* "In the first part of its course"—I quote from my *Anatomy of the Horse*—"the duct diminishes a little in its caliber; from about the middle, however, it begins to enlarge again, and soon after acquires its former diameter." This will account for the usual seat of obstruction. What the nature of the obstruction is, whether it consist in some tumefaction, partial or general, of the lining membrane, or arise from the effusion of lymph into the passages, or whether it be the effect, simply, of concretion and lodgment of secretion, natural or altered in condition, it may not be in our power precisely to determine, although a pretty conclusive inference may generally be drawn from due consideration of the circumstances of the case; let it, however, consist in which it may of these three pathological conditions, it will not materially alter our views of treatment; which, as far as my own practice has gone, will probably be best elucidated by the following detail:

An aged, cream-coloured Hanoverian horse, that had in his younger and better days been honorably employed in drawing the king's state carriage, was brought to me for being troubled with "watery eyes," producing ophthalmic irritation, and tumidity and soreness of the conjunctival membrane, with nebulous opacity of the cornea, and intolerance of light to such a degree that the eyes, especially one, were all but closed. Another ill-consequence of this overflow of the tears out of their natural channel was destruction of the hair and excoriation and soreness of the cheek below the eye. This horse had—the same as all his peculiar breed have—eyes of the Albino description; whether such eyes manifest any particular susceptibility to disorder of this kind, I cannot say.

August 4th, 1841.—Having provided myself with three wax

* English veterinarians have denied the existence of this sac; the best argument I can offer of its presence is *dissection*—the same that has convinced myself. For a description of it, as it exists in horses, consult my 'Anatomy of the Horse,' page 374.

bougies of the smallest size made use of by surgeons, I had the horse cast, and his head extended and placed in a convenient posture for operation upon the eye. An assistant firmly maintained the eyelids apart, while I, choosing the inferior puncture—it being the larger and having the more direct passage—for operation, readily introduced into it a bougie, but had pushed it no farther than into the lachrymal sac before it bent and became useless. Withdrawing this, I passed a second bougie which, by dexterous manipulation and some force, I succeeded in insinuating into the duct, through which it readily passed onward to the extent of seven inches; then, on further force being used, it bent, as the first had done, and was in consequence withdrawn. The act of withdrawal I found to require more force than the introduction, in consequence of the cohesion between the membrane and bougie, arising from the latter having become softened; and the result was that, just as the operation was concluded, about one eighth of an inch of the end of the bougie broke off and remained within the puncture; however, it easily became extracted with a pair of dissecting forceps. Still, such an accident, which might have proved serious, was enough to make me resolve in my mind not again to use the common bougie, but to have a whalebone probe manufactured for the purpose. For this time, therefore, I released my patient.

5th.—The eye shows a slight inflammatory appearance from what was done yesterday; but the flow of tears over the face is diminished, leading me to believe that the bougie has done some good. At the exit of the duct within the nostril there is a little coagulum resting.

6th.—Tears still running over the cheek, and, having provided myself with a whalebone probe of sufficient length—thirteen inches—and the requisite size, I determined this morning to renew my attempts to permeate the duct. I also had, this time, by me, a pewter syringe, with a nozzle sufficiently pointed and fine to enter the puncta. I first introduced the whalebone probe, as on a former occasion I had the bougie, which passed readily enough into the lachrymal sac, but required withdrawing for a little way and variously manipulating before I could get it to enter the duct. Presently it

did so, and then with slight force was easily pushed onward to the extent of eight inches: here it stopped, and no pressure safe to be used, could force it further. It had, in fact, reached the tortuous part of the canal, through the curvatures of which I was not able to make it pass: I therefore withdrew it. I next tried what effect syringing the puncta would have: the warm water was readily injected into the sac, which instantly became distended; but, instead of flowing onward into the duct, all of it regurgitated into the eye. Now I thought I would apply the syringe to the aperture of the duct within the nose; first, however, passing up the probe. The probe could not be pushed up further than about two inches; stopping as it had done before, at the part where the canal grows tortuous. The injected water, however, found passage and exit through the puncta, flowing out in a continuous stream over the eye. I served the opposite eye in the same manner, succeeding equally well, and then suffered my patient once more to rise. This time I felt satisfied with my operations: I now entertained no doubt I should make a cure of the watery eyes. After the operation I had the eyes fomented daily, and ordered some cathartic medicine.

11th.—Both eyes looking much better: not half the quantity of tears as formerly flow the wrong way. Slight conjunctival inflammation.

15th.—Very little lachrymation over the face; the eyes looking greatly improved; neither inflamed so much, nor to the same degree as before intolerant of light.

20th.—The amendment has been uninterruptedly progressive. The tears now flow the proper way: the horse is cured of his “watery eyes.”

I have thought, since the occurrence of the above, that the catgut bougies employed in surgical practice, would prove just the thing for a case of this kind; and might possibly, were it necessary, be insinuated through the curvatures of the canal. But, may we not succeed in curing such cases as this by syringing alone? I think we shall find we may. If not, then will come the question about the kind and use of the bougie.

TUMOURS AND FUNGUS OF THE ORBIT.

Cases of this description will every now and then occur in practice, varying more or less in their kind and character; and I believe that injury of some sort, blows most likely, will be found to be the common originator of them. I remember the case of a horse belonging to the Artillery, in which an exostosis proceeding from the orbital arch had grown to the magnitude of a horse-chestnut, and by a tendency downwards had half obstructed vision, independently of the mischief it was doing by pressure upon the eyeball. This case admitted of operation.

Of the several cases of fungus growing from or connected with the orbit that have come to my knowledge, the following, arising in congenital defect, is one of the most curious :—

Mr. Perry, V.S., Swaffham, Norfolk, was, in July 1832, requested to see a foal, three days old, which was said “to have no eyes.” He went to see it, and to his surprise “found within the orbit, on the near side, an excrescence of fungus, about the size of a common pistol-ball, without any organic structure. In the other orbit it was somewhat larger, answering in appearance to the former, with the addition of the membrana nictitans.” —*Veterinarian* for 1834.

SECTION XVIII.

DISEASES OF THE LYMPHATIC SYSTEM.

GLANDERS.
FARCY.

| OTHER DISEASES.

FROM perusal of the various works treating of hippopathology, even from ancient date down to the present time, we learn that diseases, as generations and ages have rolled on, have remained unchanged in their nature notwithstanding the alterations in other respects they have manifestly undergone. In virulence or malignity many of them now are quite different from what they formerly were; in amount of prevalence or in epidemical character, others have shown as striking changes. Grease, canker, strangles, farcy, glanders, are still in nature the same they ever were; yet how prevalent they were wont to be compared to what they are now-a-days! The state of horses in general, all large horse establishments, our cavalry in particular, bear record of these facts. I have oftentimes heard my father—who was for thirty years senior veterinary surgeon to the ordnance—say, when he first entered the service, to such an extent did grease and canker prevail, and in such malignant and incurable forms, that numbers of horses infested with these diseases had been, for years past he learnt, annually shot as incurable: so bad was the stable discipline, and so wretched the state of veterinary practice. What, however, would be thought of an army veterinary surgeon at the present day in whose regiment was found a horse incurably greased or cankered? Nay, no very wholesome opinion would be formed of such an officer, or of the stable-management practised in his regiment, were cases of this description, in any degree beyond a mere accidental occurrence, known even to *exist*! So great is the beneficial change wrought in our

cavalry through the introduction into the service of veterinary surgeons.

I can recollect, myself, the day when glanders and farcy prevailed to that extent among the horses of public departments that hundreds—nay, thousands—of pounds sterling were yearly sacrificed at the horse-slaughterers' shrines: during the last seventeen years, however, that I have served in the Guards, I have had to treat but four regimental cases of these diseases; and these four—as I shall hereafter be able to show—would not have occurred had not the regiment gone into the locality of contamination.

Another most important—most tristful change that has taken place in respect to glanders and farcy, is the transfer of the disease from the quadruped to the human being. Many years ago the late Professor of the Veterinary College taught—and every disciple of his believed—that the disease was peculiar, in its infection restricted, to the horse and his fellows in species, the ass and the mule: sad, however, to relate, scarce twenty years had this doctrine, *ex cathedra*, prevailed, when a veterinary student, a schoolfellow of mine, through dissection contracted the disease, proving but too fatally in his own person, poor fellow! the complete fallacy of all notions about insusceptibility; since which I need hardly add, the melancholy truth of the human as well as the equine species being obnoxious to both glanders and farcy has had but too many mournful realizations.

In the investigation I am about to institute into the causes and nature of glanders and farcy, and into the efficacy of such medicaments as have at one time or another been brought forward as *remedies* or *antidotes* for those diseases, I do not anticipate being able to elicit or produce much, if anything, that is *new*: should I, however, succeed in culling such materials from the ampler sources of information lying open before me as shall, by judicious compilation, form what our neighbours the French are pleased to call, in briefer language than we can express the same, a *corps de doctrine*, I may, at least, become entitled to the merit of having laid a foundation serviceable to future inquirers in the same mysterious department of science.

GLANDERS.

THE DERIVATION of our word *glanders* is traceable through the French language, from which we appear to have borrowed it, to the Latin roots *glandula* and *glans*; the latter signifying any fruit kernel, such as a chestnut or acorn; the former, its diminutive, any small fruit kernel; and both afterwards used in medicine to denote the glands of the body, many of which—such as were then so called—are small and comparable, both in shape and size, to acorns or other kernels. Celsus applies the term *glandula* to a swelling in the neck, supposed to be glandular;* and Vegetius uses the same to denote swollen glands “between the cheek-bones and lower jaws:” from his saying, however, that the *glandules* are “especially troublesome to *foales*,”† it would appear the disease he meant to describe was not glanders, but strangles. The French veterinarians, following the ancient phraseology, called a horse exhibiting any submaxillary tumour or enlargement, *glandé*; not with any especial reference to glanders, but simply because his glands or “kernels,” as our farriers denominate them, had become enlarged: hence with the French a horse was said to be *glandé de gourme*, as well as *glandé de morve* and *glandé de farcin*.‡ It seems to have been our English writers on farriery who have restricted the application of the term to the foul and malignant disease now known under that appellation: before then, glanders appears to have had no other meaning save that the horse had tumefied glands, or that, in the farrier’s phrase, “his kernels had come down.” The French call the disease *la morve*. A horse, however, in the estimation of Lafosse, is not to be regarded as having *la morve proprement dite*, unless he be *glandé* or have tumefaction of his glands.

* De medicinâ.

† De Arte Veterinariâ.

‡ GLANDE (cheval) est celui qui a une glande sous la ganache, plus apparente que dans l’état naturel, ou qui a une tumefaction sous la ganache: on dit glandé de gourme, de morve, de farcin. (‘Dictionnaire d’Hippiatrique,’ par M. Lafosse.)

DEFINITION.—Glanders consists in a discharge, from one or both nostrils, of matter which by transfer or inoculation will produce the disease in another animal (of the equine or human species), and which discharge is, sooner or later, accompanied by vascular injection and chancreous ulceration of the Schneiderian membrane, by tumefaction of the submaxillary lymphatic glands, and by farcy.

SYMPTOMS OF GLANDERS.

DISCHARGE from the nose, enlargement of the submaxillary lymphatic glands, vascular injection or inflammation of the membrane lining the nose and different sinuses of the head, thickening, ulceration of it, mortification, exfoliation of the septal cartilage and turbinated bones, constitute the local and characteristic symptoms of glanders: they may be, and occasionally are, all present; commonly but two of them make their appearance in the incipient stages of the sub-acute and in the chronic forms of the disease, which two, or even one without the other, may be sufficient to constitute a case of glanders.

CONSTITUTIONAL DISORDER, either to a degree to attract the notice of those who look after the animal, or so slight as to be detectible by the professional attendant alone, invariably attends or ushers in an attack of glanders. There may or may not be palpable depression of spirits, and disinclination or indifference for food; there will be, more or less, discoverable indications of fever, such as increase of pulse, heat and dryness of mouth, heavy and watery appearance of the eyes, roughness and opacity of the coat. The horse may not be thought or called "amiss" by the groom, and yet the veterinary surgeon finds in him evident signs of indisposition. A great many years ago, an old and much-respected professional friend of mine, Mr. Berrington, formerly veterinary surgeon to the staff corps of cavalry, and late of the cavalry dépôt at Maidstone, drew my attention to this premonitory or accompanying disorder of the first stage of glanders; and subsequent observation not only confirmed in my mind the truth of his practical remark, that "few or no cases commenced without it," but likewise convinced me that even those cases of sub-acute disease which

appeared completely to regain their health and spirits, were not, on closer examination, left altogether free from this febrile state of system. In general, after the first stage is passed, as soon as the discharges from the nose have become established, the animal rallies from any indisposition he may have shown, recovers his spirits and appetite, and, to the common observer, appears as well as ever. This manifestation of recovery has led unprofessional persons to suppose that, were it not for "the running at the nose," and "the kernels," there would be little or nothing the matter with the horse: in all other respects he is regarded as being in sound and good health, and to such persons as have not seen him during the attack of the glanders, or whose observation has not been sufficient to enable them to detect any difference in him at that time, he has never appeared otherwise than in his usual state of health: hence the prevalence of the common notion, that glandered horses can do work the same as others; and, indeed, such is for a time the trifling constitutional derangement occasioned by the disease that they, in reality, are capable of work—though, still, not of the severest kind—so long as the disease in the head continues either in the sub-acute or chronic form, and the lungs hold their integrity. The preservation of their condition, and the good looks glandered horses for a time maintain, it is also that, when artful means are taken to conceal the nasal discharge and the tumours under the throat, enable sharpers to dispose of them as sound horses. In fine, one of the characteristic symptoms of the disease, in certain stages, is the unaffected good spirits and condition, and feelings of health, the animal manifestly enjoys.

LEBLANC confirms the foregoing observations. "I have uniformly observed," says he, "that horses exposed to causes considered as productive of glanders have exhibited some symptoms of general functional disorder prior to the manifestation of the malady;" adding, that "horses that become glandered and farcied *without* this premonitory disorder, *derive the disease from contagion.*" Should this latter remark prove well founded it might turn out one of some value to us: I fear, however, it is one unconfirmed by experience.

DISCHARGE FROM THE NOSE, though the symptom

which commonly first attracts notice, is not the first in the order of appearance of the local symptoms, it being often, I believe generally, preceded by the tumefaction of the glands underneath the throat. At its commencement, the discharge is scanty and limpid, amounting to nothing beyond a little aqueous or serous fluid, trickling or dropping, commonly from one nostril only, but without intermission. The next day, or the day after, this watery discharge mostly appears streaked or intermingled with ropes of mucus; and in a day or two after that it will probably have become altogether mucous in its nature, and now glairy in its aspect, after which it gradually assumes a tinge of yellow, from the admixture with the mucus of albuminous matters, the aqueous discharge now diminishing, but not altogether ceasing. From this, which may be regarded as the *incipient or first stage of glanders*, the ordinary course of the disease is into—

THE SECOND OR ULCERATIVE STAGE. From being aqueous or aqueo-mucous, with little or no show of purulent matter, the discharge by degrees acquires consistence, turns of a straw colour, exhibits true purulent characters, and soon follows in abundance, there remaining, however, still more or less aqueous stream mingled along with it. In time, this augmented flux, showing less of the aqueous admixture, becomes thicker, less disposed to run off, acquires tenacity, and begins to cling about the hairs fringing the nostrils. At length, it becomes converted into a truly viscous flux, possessing glutinous properties of that remarkable kind that, like birdlime or glue, it sticks, nay, firmly adheres to the hair of the nostril, collecting and concreting within the *cornu* or fold of the *ala nasi*, and clogging, and more or less obstructing, the aperture, and in this manner, by occasioning impediment to the breathing, generating a snuffling noise in the passage of the air something similar to the mucous or bronchial *râle*, and which to the ear of the experienced practitioner is a sound so peculiarly characteristic of the state the patient is in, that, the moment he hears it, he is but too well informed of the nature of the case he is about to inspect. Indeed, with this glutinous flux in any considerable quantity, such is the foul state outwardly and the obstructed condition inwardly of the nasal passages, in consequence of the adhesion and retention of the discharges, that when even but one nostril is

affected the inconvenience caused to respiration is much felt ; when both, however, are in the same foul and obstructed condition, there exists, at the times that the accumulation of matter becomes great, danger even of suffocation. Also now, or before this, according to the source and nature of the discharges, will be observed, what was not perceptible in the first stage, nor perhaps in the beginning of the second, *fetor* ; and that of so peculiarly an offensive nature that often it, of itself, is sufficient to enable the veterinarian to pronounce on the case. Yellow, purulent, viscous, or glutinous discharges betoken either the acute or sub-acute form of glanders : in cases in which the disease, losing activity, degenerates into a chronic stage, the flux may continue from the first of a glairy or aqueo-mucous character, or it may turn like that of a nasal gleet, looking like so much whitening and water, and in that condition is not infrequently seen grumous. On the other hand, when the disease runs its natural course in a longer or shorter space of time, according to varieties in it which I shall hereafter point out, the nasal fluxes—changing with the havoc the ulceration is making, first, in the membrane, and secondly on the bones and cartilages—become of a most disgustingly offensive nature, and, in their hue, change from yellow to green, or to dirty brown or leaden colour ; or exhibit streaks of blood ; or bring away with them, every time the horse essays by blowing to clear his nose, masses of scab and exfoliated cartilage and even bone ; thus denoting that the disease has reached its final stage, and that partial suffocation and consequent constitutional irritation must shortly put an end to the distressed animal's sufferings. From this, which is the common succession of the discharges in acute and sub-acute cases, varieties in their appearance and quantity will occur, depending on the degree of the vascular or inflammatory action going on within the chambers of the nose ; on the presence, extent, and depth of ulceration ; on the medicinal treatment the patient may be subjected to, the regimen he is placed under, the atmosphere he is breathing, the exercise he is taking, &c. Bloody discharges, or rather blood tinging the discharges, will, in the latter stages in particular, every now and then become apparent : when present, they augur either deep or extensive ulceration, or a disposition to ecchymosis,

either from laxity of fibre, or some change in the condition of the blood; and their appearance is always inauspicious, though I never, myself, saw blood lost to any but trifling amount.

AN ANALYSIS OF THE NASAL DISCHARGES has been made by Lassaigue. He finds them to consist of *albumen*, *mucus*, *sub-carbonate of soda*, *chloruret of sodium*, *calcareous phosphate* (trifling in quantity), and *water*; the water making the largest proportion. In the normal state, the secretion of the Schneiderian membrane contains the same matters, with the exception of the albumen, whose presence, in large proportion, keeps pretty nearly pace with the quantity of purulent matter. From this it would appear that the *gluey* or *glutinous discharges* owe their adhesive properties to the predominance of *albumen* in their composition: they may, the same as purulent matter, issue out of the follicles of the membrane; though, in any considerable quantity, I believe they may invariably be regarded as the product of ulceration.

VASCULAR INJECTION or INFLAMMATION is observable in all acute and in certain stages of sub-acute cases, upon the surface of the Schneiderian membrane; though it is uncommon to see any intense degree of inflammation. This membrane, which in health and under repose of body is of a pale flesh colour, under exercise of a vermilion hue, in a state of disease often displays patchy blushes upon its septal surface, having a peculiar shiny aspect, produced by the slimy or glairy secretion coating the surface; and we can generally perceive red vessels in places traversing its substance. Now and then, from the discharges adhering to it, the surface will present a patchiness of yellow intermingled with the shiny red. Should all signs of vascular action pass away, the disease, from an acute or a sub-acute running into a chronic form, the surface of the membrane will become pallid or acquire a leaden hue; the ulcers, should there be any, at the same time undergoing the same process of deflorescence.

The late Professor Coleman characterised the inflammation of glanders as *specific*. As regards its products, it certainly is so; at the same time there is nothing in its aspect, abstractedly as inflammation, which can lead one to pronounce it the *inflam-*

mation of glanders. Were it not for the discharges, and more than them, for the ulceration, we should probably discover no difference between glanderous and common inflammation.

THICKENING is a change the inflamed membrane, from infiltration, quickly undergoes, and one that often continues advancing, even after all appearances of inflammation have vanished, so that in the end the membrane not only becomes greatly augmented in substance, but much altered in texture. These changes, hardly discoverable to the eye, from the small portion of membrane visible to us in the living animal, are exposed when we come to examine the head after death: we are then often astonished to find what a degree of thickness the membrane—in the nasal chambers, or in the sinuses, or in both—has attained through interstitial deposit or actual growth, something resembling the hypertrophic changes exhibited by the uterine members during the process of pregnancy. In some cases—in the sinuses especially, perhaps solely—such is the exuberance of the nutrient vessels of the membrane, that it sprouts or *granulates* upon the surface in some such manner as the conjunctive membrane of the eye of man is known to do in that peculiar human disease called *granular conjunctiva*. In cases in which the inflammatory action has confined its attack to or expended its force principally on the sinuses of the head, we not unfrequently find effusions of lymph upon the membrane lining them; and these often tend, as they lie upon the floors of the cavities, more or less to obstruct their outlets, and in this manner put a temporary or permanent arrest to the nasal discharges: hence one reason why a glandered horse ejects from his nose a great deal more matter at one time than at another.

ULCERATION is the symptom upon which we place the greatest reliance as denoting the presence of glanders. The simple circumstance of its appearance is enough to arouse the strongest suspicions; while that of its appearing in the form of *chancre* is conclusive. Scratch the Schneiderian membrane with a pin or nail—wound it in any ordinary way—and the result will be a sore of a common nature; bleeding at first, but, subsequently, without the generation perhaps of pus, granulae

ting, and so in the usual mode healing: but, introduce into this scratch *virus* taken from a glandered or farcied animal, and the result will be that, losing all disposition to heal, the lesion will inflame and secrete an ichorous matter and become converted into a transparent vesicle, surrounded by an *areola* or circular blush upon the membrane. The next day the vesicle has broken, and we perceive in the place of it, a pale, foul, superficial ulceration, which in the course of another day acquires the genuine characters of the glanderous chancre—an elevated, circular, pinkish border, including a base of dingy or faint yellow albuminous matter, which on being wiped or irritated commences bleeding, and, on the matter being removed, exposes, when the ulcer is deep, the bare cartilage beneath; when superficial, a red spotted, rugged, foul, bleeding bottom. From its tendency to spread, the ulcer speedily loses its circular figure, exchanging that for one too irregular and variable in shape to admit of any further characterisation: it has, in fact, now become a foul spreading ulceration, extending on every side, coalescing with similar ulcerations in its vicinity, having for its base the cartilage of the *septum nasi*, which alone, from its comparative insusceptibility of the ulcerative action, puts a temporary arrest to its devouring activity. It is when the ulcers have eaten down to the substance of the cartilage, or when others that are situated high up in the *meatus* of the nose, out of sight, have laid bare the turbinated bones, and that the substance of the cartilage and bone becomes attacked by the disease, that mortification and sloughing or exfoliation of these parts takes place, they being too lowly vitalized to carry on the ulcerative process: at this time it is likewise that discharges, foul to a degree and fetid past bearing, of a dirty green, or brown, or blackish nature, are running in great profusion, bringing with them sloughs of bone and cartilage, and clogging and obstructing the nasal passages to that degree that the distressed animal, in the last and worst stage of glanders, may hourly expect to end his life of torment by an act of suffocation. I do not remember to have seen holes made *through* the *septum nasi* by ulceration;* but in such virulent forms of the

* This may arise from a process of deposition upon the opposite side,

disease as I have just described, it is not uncommon to find the turbinated bones ulcerated through into the nasal sinus ; and I have seen heads of glandered horses that have been next to destitute, on one or both sides, of any turbinated bones, they have been consumed through the ravages of the ulcerative and exfoliating processes.

MILIARY ULCERATION :—So is called an ulceration of the same membrane, differing altogether in its aspect and tendency from the true chancrous ulceration we have just been considering. With the miliary ulceration upon it, the surface of the membrane has the appearance—as nearly as I can describe it—of worm-eaten wood, every part of it appearing as though full of pin-holes. This ulceration is not seen in acute glanders, at least I never saw it ; nor is it often found in the sub-acute disease ; but is peculiar, I may I think say, to chronic glanders.

DUPUY,* who has well described this species of glanders, characterises these “little ulcerations” as the result of the “degeneration” of miliary tubercles ; and represents them, truly, as having “thin edges, unevenly excavated, like pin-holes ; with this difference, however, that the hole made by a pin would be deep and pointed, whereas these ulcerations are shallow and have thin edges. They are commonly regarded as erosions, sometimes mistaken for the dilated orifices of mucous follicles ; though, if they be examined after the mucus in which they are sheathed has been removed, and the membrane has been cleansed with water, they will be found to be so many little ulcerations. The membrane of the septum is frequently covered with these exulcerations, with its surface, in places, elevated. They are, however, superficial, penetrating merely through somethin layers of the cellular tissue of the membrane, thereby rendering its surface irregular, uneven, and scabrous. They follow the course of the large veins upon the septum. They are found also grouped within the fold of the *ala nasi*, particularly on the left side, and upon the turbinated prominences and their appendices.”

ENLARGEMENT OF THE SUBMAXILLARY LYMPH.

* ‘De l’Affection Tuberculeuse,’ Paris, 1817.

PHATIC GLANDS—*kernel*s as they are called by grooms—*buboes*, as they might with strict pathological propriety be denominated were they seated in the groin instead of underneath the jaw—is in general the earliest external indication we have of the approach of glanders. In cases of inoculation, swollen glands are perceptible on the third day, ulceration appearing on the fourth. These swellings owe their origin to the irritation created within the nose, the same as buboes are occasioned by irritation set up in the organs of generation; and in horses as well as in man the lymphatic glands may become tumefied from common as well as from specific irritation: a tight shoe may occasion a bubo in a man; and I have known common injuries, wounds about the nose or mouth, or in the limbs, occasion the same thing in horses, though in the latter the case is comparatively rare. At first, the submaxillary swelling in glanders is commonly small and round, isolated and moveable; or it may be that more glands than one are enlarged, and then the swelling will have a sort of lobulous as well as loose feel. Now and then the tumefaction will be so great at first that we may suppose it to be an attack of strangles. I have known the swelling altogether to be of that magnitude that it has projected beneath the lower border of the under jaw: indeed, its magnitude may be said to vary, taking the extreme cases, from a horse-bean to a goose-egg. D'Arboval has well observed, in regard to these swellings, that "their smallness is never to be received as a proof that no glanders is present;" and he adds, "while their multiplicity, especially their successive development one after another, is ever a symptom for alarm." On their first development these swellings are in general painful to pressure, and particularly when their development has been quick, when they have in a short time grown to large size, evincing thereby acuteness in the disease: in cases, however, in which they have never acquired much magnitude, but remained single and stunted, or disinclined to enlarge, becoming firmer in substance and fixed in their situation, they possess but little feeling; indeed, often in the course of time, the disease having become sub-acute or chronic, they acquire a scirrhus hardness, and almost total insensibility. When first found, as I said before, the tumour frequently is loose and moveable; as it acquires firm-

ness, however, it acquires fixity, getting by degrees adherent to the side of the jaw, the tumefaction being confined to whichever side of the head the disease occupies. A swollen gland or mass of glands forming a tumour of this description is, perhaps, the most usual kind of submaxillary tumefaction in glanders: it is known by its isolated character, by its distinctly being the only tumour present, the skin being drawn tensely over it, and the surrounding space being perfectly clear from any tumefaction; lastly, by its close and immoveable adherence to the side of the jaw against which it lies. Should there be disease in both chambers of the nose, we shall have tumefied glands on both sides, though it will rarely happen that both sets of glands will swell at one and the same time. While recent or susceptible of pain from compression, these tumours are apt to fluctuate in magnitude, being at one time large, at another comparatively small. In general, I have known the opposite effect produced. I do not remember seeing suppurative action produced in them; commonly, as I have before observed, they become hard, void of sensibility, and scirrhus in their nature, and so continue to the end. In reference to their variable character,

DUPUY makes the following observations on these glands:—"When the mucous membrane of the chambers of the nose is affected, the sublingual (submaxillary) glands become tumefied, and undergo some very variable changes. In succession, they grow, in the same subject, swollen, firm, painful, and moveable. In a short time after this they become insensible, diminished in volume, and appear to resume their natural condition; then again, all on a sudden, they recommence swelling, and in the course of a few days grow larger than ever they have been."

TUMEFACTION OF THE ALA NASI is a frequent, not a constant symptom of glanders: when present, it is always highly characteristic of the acute disease. It is seen in virulent and malignant attacks, and especially when the disease has set in suddenly; it is seldom an accompaniment of the sub-acute forms of glanders so long as they remain sub-acute, and is never seen in the chronic varieties. Should the tumefaction not accompany the onset of acute glanders, it is almost certain

to come on during the latter stages, prior to dissolution. The swelling of the nostrils may arise from the intensity and spread of the inflammation in the interior of the nose: very often, however, it is obviously the result of an attack of farcy of the integuments clothing the nostrils, including frequently the upper lip as well; and in that case there will be tumefied or corded lymphatics perceptible upon the swollen parts, and very frequently traceable from them along the cheek to the border of the jaw, proceeding into the submaxillary glands. Pustules or farcy-buds will also appear, and break and become ulcers, seated occasionally within the fold of the *ala nasi*, the same as in other parts of the body. The tumefaction of the nostrils when combined—which it commonly is—with a profusion of gummy discharge, adds greatly to the embarrassment in the breathing. The partial closure of one nostril produces a good deal of inconvenience and annoyance: when this happens with both, the suffering and distress occasioned will be likely, as I before observed, to end in suffocation, unless relief in some way or other be afforded.

DOES GLANDERS SHOW ANY PREDILECTION FOR THE LEFT OR NEAR SIDE OF THE HEAD?

DUPUY states that it does. His words are—"In summing up the cases I have reported, it will be remarked that of those horses who had only the nasal membrane affected, *there is but one case in which the right nostril proved the seat of disease; whilst there are eight having the disease on the near side.* It is without doubt a peculiarity that the membrane of the left chamber of the nose should most frequently be the seat of the tuberculous affection: it is not very favorable to the notion of glanderous contagion; nay, it goes to contradict all that has been said on that subject. In the greatest number of the cases, the disease pervaded both sides of the nose." Out of fifty-eight recorded cases of glanders that have fallen under my observation, twenty-one have had the disease confined to the near side of the nasal cavity, nineteen to the off side, and eighteen have shown it in both sides. My own experience, therefore, will not allow me to step out of my road—as some writers have done—to endeavour to account for a fact whose truth is by no means confirmed, and which, were there any truth in it, must

be admitted to be of that extraordinary pathological character that seems to defy all attempts at explanation.

DIAGNOSIS OF GLANDERS.

The diseases with which glanders is liable to be confounded or for which it may be mistaken are, *catarrh*, *nasal gleet*, and *strangles*.

THE CHARACTERISTIC SIGNS OF GLANDERS are with singular accuracy, and with succinctness too, described by Solleysell.* "The signs by which the disease may be known, are when a horse, already too old to be troubled with strangles, without a cough, voids matter by the nose, and has a kernel sticking to the bone; and besides, in glanders the matter usually flows from one nostril, whereas in a cold it runs almost always out of both."—"Some cast the matter that is voided by the nostrils into water, and, if it swim on the top, they conclude the horse to be free of this distemper; but if it sink to the bottom, it is a sign of glanders: the principal use of this experiment being to distinguish the pus."—"But you must not depend on the certainty of this sign; for if the matter stick to the nostrils like glue, it is a bad sign, and you may conclude the disease to be the glanders, though the matter do swim on the top."—"When either the breath or matter that comes out of the nostrils *stinks*, the disease is almost incurable."—"I have seen horses troubled with this distemper without kernels, or, if there were any, they were little and moveable; and the only sign by which we could discover it to be glanders was the glueyness of the matter."

DURUY tells us that suspicion of harbouring glanders—when the symptoms manifest doubt—will always rest upon a horse possessing the character of having been reared in a low, wet, marshy country; such as flat feet, long hairy legs, exuberant chestnuts, &c., or upon one that has a narrow chest and razor back, or that is high upon his legs, loose made, and so forth; and upon one that coughs readily, or cannot stand much work.

* 'The Compleat Horseman,' by Sieur de Solleysell.

If, combined with these indications, the mucons lining of the nose be thickened, infiltrated, discoloured, as likewise the conjunctive and nictitating membranes, one of the eyes appears sunk and gummy, and the nostril curled and fouled by mucus sticking about it, we may set the case down for glanders in the first stage.

OUR DIAGNOSIS must be grounded, first, on the circumstance of the discharge coming from one or both sides of the head; secondly, on the nature of the discharges; thirdly, on the presence of ulceration, and the character of it; fourthly, on the presence and character of glandular tumefaction; fifthly, on the state of the animal's health; sixthly, on the presence of farcy; seventhly, on the absence of symptoms proper to other diseases.

The consideration of the symptoms that are present, taken collectively and with reference to their origin, together with a notice of the absence of such collateral ones as ought to be present were the disease other than it really is, will furnish us with evidence, both of a positive and a negative kind, in regard to its veritable nature; and though, after all, suspicion may lurk about the case, we shall, by taking proper precautions, not be liable to commit any very serious blunder in our practice; neither will, commonly, more than a short elapse of time be required to put an end to all our doubts and apprehensions.

FROM CATARRH—the disease with which, of all others, glanders is the most liable to be confounded—it is as difficult to draw the line of distinction in certain forms and stages as in others the difference between the two diseases becomes self-evident. A horse, we will say, has a discharge issuing from one nostril, with a submaxillary swelling on the same side; and our opinion is required on the nature of the case. Should cough or sore throat, or other symptom of catarrh, be found present, doubt need no longer exist. Should the horse be young—three, four, or even five years old—we may feel rather inclined to regard it as catarrh. The suspicious accompaniments of these two symptoms are, the absence of any concomitant catarrhal indication, the horse having been slightly “amiss,” but now appearing as well as ever again; the constancy and uniformity of the one-sided discharge; the circumscribed or

defined nature of the submaxillary tumour, together with its proximity, perhaps attachment, to the jaw-bone; the duration of the two symptoms in question, without any material alteration for better or for worse; lastly, the horse being in his adult or an aged period of life. It is quite possible the discharge may issue from *both* nostrils, and submaxillary tumours appear on both sides as well; and so will the case be rendered more like catarrh, and yet have enough about it to engender in our mind suspicions of glanders. In fact, it may positively be glanders, either in an incipient or an insidious form, or in a chronic stage. No prudent practitioner, however, would go the length, on mere inspection, to pronounce on the case; although he would consider it his duty to segregate such a horse from his companions, and place him in a situation where there could be no possibility of communication, mediate or immediate, between him and sound horses. Attentive observation and appropriate treatment will, after no very great lapse of time, demonstrate whether the case be catarrhal or not: but if not catarrh, what is it, or what can it be? Is it nasal gleet? If so considered, let such treatment as is proper for nasal gleet* be adopted, and for a reasonable time persevered in, under a hope that it may cease or "run itself dry;" still using all precautions to prevent communication with sound horses as much as if we were assured we were actually treating glanders itself. Time, I say again, must and will unravel the secret. If this cannot be or has already been given, we are at liberty to resort at once either to the test of examining—through an operation to be hereafter described—the sinuses of the head, or to that of inoculation. The supervention of chancre in the nose, or of any indication of farcy in any part of the body, would, of course, decide the question at once.

WITH STRANGLES in its early stage, it is possible, though not by an experienced hand probable, glanders may be confounded. The tumefaction of strangles at its beginning, or at times when it progresses unkindly or hardly at all, or when it assumes the aspect we call "bastard strangles,"† may something re-

* Vide vol. ii of the 'Hippopathology,' p. 24, et sequent.

† Strangles taking its ordinary course is altogether a different disease from glanders. Vide vol. i of 'Hippopathology,' p. 155, et sequent.

seem to the feel the solid defined submaxillary swellings denotive of glanders: unconnected, however, with other suspicious circumstances, we have, in the first place, no right to assume any unfavorable opinion of the case; and, in the second, supposing the *age* and state of health of the patient to afford no interpretation, heat and tenderness in the tumour, with a tendency to spread or grow prominent, and to form abscesses, together with the quality of the discharges from the nose (for there will most likely be some), will prove such in a little time as to cast away all reasonable doubt as to the true nature of the case. Should such not appear, the case must be regarded in an unfavorable light, and measures taken with it accordingly.

OTHER DISEASES still there are, for the most part of rare occurrence, which may be and have been mistaken for glanders. A discharge from the nose, and in particular from one nostril alone, being the chief or most prominent symptom of glanders, it is evident that any local disease about the head or even in the neck or lungs, giving rise to such a symptom, may, so long as the proximate cause be concealed, be thought to be glanders. Disease on either side of the mouth or throat, attended with the secretion or formation of matter, will be likely to discharge that matter through the nose as well as through the mouth, and most probably the issue will be confined to the affected side; occasioning even at the time, it is not at all improbable, by irritation, a swelling of the submaxillary lymphatic glands of the same side, and thus simulating veritable glanders as much as one disease can resemble another. Cases of this description have often baffled professional men—have too often led to erroneous judgment—too often to the destruction of the patient, when, had the true cause of the malady been discovered, a simple operation or some appropriate treatment might have saved his life.

A CARIOUS MOLAR TOOTH has in several instances led to fatal mistakes. One that occurred to Mr. Cherry, I have already given the history of.* Another I shall here transcribe from an interesting account related to the Veterinary Medical Association by Mr. Simonds, in 1839:—

* In vol. ii of the present work, p. 179.

A singular case of an ossific tumour taking its rise from the inner portion of the anterior maxillary bone, between the turbinated bones, and occupying the whole of the nasal cavity on that side. It owed its origin to the uneven wear of the molar teeth, one of which, the second on the right, had become carious. The opposing tooth soon gained upon this, from the balance of attrition being as it were destroyed, and it was presently worn down to the gums. The caries now rapidly spread to the alveolar cavities, involving them and the bony palate in the disease. A communication was established between the nasal cavity and the mouth, and from this resulted the growth of a sponge-like looking ossific tumour. Strange as it may appear, the farrier who attended the case said it was one of glanders, and the horse was ultimately destroyed. The head was afterwards brought for my inspection and opinion.—*Veterinarian* for 1840.

The next is a case respecting which Mr. Dick was consulted by letter, as follows :—

A mare has been returned and declared by two veterinary surgeons to be glandered. She had a colt about fourteen months ago. There seemed some obstruction in the nasal passages. The membrane of the nose was redder than usual ; but there was no ulceration, though at times a watery discharge. What is most remarkable is, there is a constant discharge of masticated food, especially when she is trotted ; pieces occasionally coming away as large as ordinary (physic) balls. To clear her nostrils, she sneezes with might and main, ejecting at the time the half-masticated food in all directions. After such an ejection, she may be ridden all day without discharging any more. When, however, allowed to stand and feed again, on starting afresh, she becomes as bad as ever. In other respects she appears in perfect health, and does her work well. Mr. Forbes told me that, before he sold her, he gave her a ball, and thought she had swallowed it. An hour afterwards, however, as she was being led out, the ball was ejected from her nostril. There is now a constant discharge of watery fluid, mixed with masticated food. It falls from the nostril drop by drop until she is taken out for a ride, and then she clears herself of it. The submaxillary glands are not enlarged.

To this account and appeal for advice, Mr. Dick replies :—

The case you mention is one of those which you will recollect I used to refer to in my Lectures as likely to be mistaken for glanders, but which is quite distinct from that malady. It is connected with disease of some of the molar teeth or the alveolar processes, or the velum palati. I have seen appearances very similar from the velum palati having been pierced in giving balls at the end of a sharp-pointed stick. If you will carefully examine the mouth of the mare, you will find an opening somewhere leading from it into the nose. I am

unable to write with greater precision, as you have not mentioned whether the discharge comes from one or both nostrils. You will be compelled, I think, to cast her. I am afraid you will not be able to do much good. There can be little prospect of cure, as the orifice will have assumed a fistulous character, which will be kept up by the constant passage of the food. If there exists a carious tooth or piece of bone, it must be removed, and probably the parts will require frequent cleansing by syringing. I do not know any other means of cure.

The last case of the kind I shall relate is one I transcribe from the valuable posthumous collection of the late Mr. John Field. As in Mr. Simond's case, the disease proved to be in the submaxillary bone.

On the 10th of November, 1830, an ass belonging to Mr. T—— was brought to the infirmary, having been under treatment for a disease supposed to be glanders. There was an offensive discharge from both nostrils, particularly from the near; from which, as well as from the mouth on the same side, a quantity of yellowish inspissated pus was occasionally emitted: the submaxillary gland was enlarged.

On examination, a tumour was observed over the maxillary sinus of the near side, immediately corresponding to the second molar tooth. The external surface of the anterior superior maxillary bone was considerably elevated in the course of the levator labii superioris and anterior maxillary nerve, beginning just below the escape of that nerve, at the foramen maxillare anterius. The base of the second molar tooth within the mouth was in great measure destroyed: the portions remaining in the jaw were immoveable.

Nov. 12th.—An attempt was made to remove what was left of the tooth by lancing the gums, and by using very strong forceps. This was done under an impression that the fangs of the tooth were diseased, and produced the swelling in the antrum maxillare; however, the operation was unsuccessful.—(On the same day an ass was inoculated with some of the glutinous discharge from the near nostril, on the right ala nasi, the right upper palpebra, and on both sides of the back. After a few days a little pus was found in the largest incision, but in ten days all the wounds had healed, and the animal was quite well.)

13th.—On this day the ass was cast, the hair was shaved from the tumour, and an incision was made through the skin, commencing at an inch below the molar process of the maxillary bone, and extending along the course of the alveolar process to one inch below the edge of the tumour; another transverse incision was made across the first, and the four flaps were dissected back, and the superficial facial muscles were divided in the line of the second incision down to the maxillary bone. The trephine removed a portion of the thin bony plate covering the sinus; and through this opening nodules of bone, such as are commonly met with in diseases of the frontal and maxillary sinuses, were

discovered, instead of the diseased fangs we expected to find. In order to remove these nodules, which were very large, it was necessary to make successive applications of the trephine, chisel, and saw. After the bone was removed, a large quantity of highly offensive inspissated pus was scooped out; but the largest portion was firmly attached to the membrane of the nose and antrum, and required considerable force, and some cutting, to detach it. The surface of the sinus was next ascertained to be uniform, and not to have any uncovered bone. The divided levator labii superioris was then united by suture, and the crucial flaps replaced and brought together. Very little blood was lost.

16th.—No increase of swelling had taken place in the face: there was a slight discharge from the near nostril. The ass fed, and was free from fever. A little pus appeared between the edges of the wounds.

19th.—Purulent discharge from nostril still offensive—tumour from submaxillary lymphatic gland much diminished. Ass fed well.

26th.—Wounds had all healed, save some superfluous granulations; about one third of an inch broad, between the edges of the upper incision. Discharge from nostril less, but still offensive.

On the 4th of December the discharge had almost entirely ceased, the lymphatic gland was much reduced in size, and on the 20th of the same month he went away perfectly cured, and had no return of the disease.

The common notion is—and it is one consonant with reason, and for the most part, I believe, in accordance with practice—that matters coming from the lungs or windpipe through the larynx become discharged from both nostrils, or are as likely to find their way into one as into the other: I cannot, however, for my own part, help thinking, that every now and then it happens that a channel on one side becomes so established that all the matters as they issue from the larynx, run sideways along it; none, unless through coughing, or other violent emotion, going by the other side. Should this supposition be founded in truth it will serve to place us more on our guard in practice.

Bearing in mind that neither discharge from the nose, though it be but from one side, nor submaxillary tumour, though it be affixed to the jaw-bone, nor even ulceration of the Schneiderian membrane, unless it be of a certain character, constitutes a case of glanders, it becomes our bounden duty to institute in every instance suspected or asserted to be glanders, a searching, satisfactory inquiry. Numbers of horses—of valuable horses—no doubt, have fallen sacrifices to the ignorance or

precipitancy of their medical attendants : a more skilful and thorough investigation of their cases, greater patience, allowing for the development of symptoms, would have shown where the errors lay, and have saved, as well as many lives, the veterinary practice of days gone by a load of opprobrium since passed into it.

VARIETIES OF GLANDERS.

WHATEVER division we may make of glanders—whatever kinds or species we may distinguish in it, we must bear in mind, the disease in nature remains the same. The varieties of aspect, of intensity, of duration, observable in it, are attributable to the part in which the disease is seated, to the stage through which it is passing, to the age, &c., of the patient, and to other circumstances, which in their proper places will hereafter receive notice. We might found our division upon the circumstance of glanders being seated at one time within the nose, at another within the sinuses of the head, within the lungs, within the larynx. We might distinguish as species or varieties the different appearances the disease assumes even in the same part, which we now regard as *stages*; such as the first or incipient stage, the ulcerative, the sloughing or typhoid stage, &c. To both these, I prefer the division based upon the intensity and duration of glanders, as the one which will be found most useful to us in practice, and which has this advantage over the two others we have noticed, that, although the three varieties will be found running into each other, yet no sooner does a fresh species make its appearance than that which existed before necessarily ends. According to notions that have grown up in my mind, after an observation of many years of glanders in all its forms and phases, the best division we can, in my opinion for practical purposes, make of the subject, is into *acute*, *sub-acute*, and *chronic*: the first, comprising such forms of the disease as rapidly and uninterruptedly run their course and end in death; the second, such as present the pathological character of acute glanders, and yet manifest the sluggishness of the chronic variety; the third, that species of the disease in which

all progress seems suspended, the morbid parts within the reach of our examination presenting no indication whatever of activity—of inflammation, ulceration, &c. To these we may add a variety our continental professional brethren have named *typhoid glanders*; but which is nothing more than the most malignant form of the acute, the malignancy being owing to the state of health of the patient at the time, the situation, &c. Also, we have to add, *epizootic* or *enzootic glanders*, an appellation given to the disease when unusually prevalent; and *farcy-glanders*, which is no more than farcy combined with glanders.

ACUTE GLANDERS.—The purest and best specimen afforded us of this variety is the disease resulting from inoculation, that which we might denominate—

INOCULATED GLANDERS.—Supposing inoculation with glanderous matter to be performed on the Schneiderian membrane, sometimes so early as the third, always on the fourth day afterwards—providing the inoculation take effect—may be discovered swelling of the submaxillary lymphatic glands corresponding to the side infected, with, in general, some light discharge from the inoculated nostril, ulceration following on the fifth or sixth day: and these results are often accompanied by some appearance of farcy, manifested in the tumefaction of that chain of lymphatic vessels which extends from the ala nasi and angle of the mouth to the swollen glands under the throat. From this time the disease within the nose spreads rapidly, the nasal membrane quickly becoming a sheet of ulceration, and issuing discharges in that profusion and of that glutinous character that in some cases, so early as the tenth day, in hardly any later than the twentieth, the animal—a young ass, commonly—dies actually suffocated through obstruction in the nasal passages, caused by the accumulation of the discharges within them, combined with the agglutination and tumefaction of the nostrils outwardly.

ACUTE GLANDERS, however, is often enough to be seen—in situations where glanders is prevalent—where there is no reason to suspect either inoculation or contagion to have been present. It commences with symptoms of slight febrile catarrhal disorder, and the fever attendant never quits the patients; we, therefore, might with some reason give it the name of *febrile glanders*.

In the young ass, as we have seen, the disease, once commenced, rages with peculiar violence and malignancy ; indeed, so remarkably so that the ass has, by many writers, been regarded as more susceptible of taking or harbouring the disease than the horse. And from my own experience, while serving in the peninsular campaign, I can attest the virulent and destructive course the disease likewise assumes in mules. Still, we are not in the habit of inoculating horses ; and, moreover, we rarely find horse-patients of the same tender age, or of the impoverished condition asses are in ; and again, horses are taken greater care of when sick than the poor despised ass is : on the whole, therefore, considering all these circumstances, I am not disposed to admit that either the ass or the mule presents any extraordinary *innate* susceptibility ; but rather think that it is all acquired in the age and condition in which the animal receives the disease.

THE COURSE OF ACUTE GLANDERS is uninterrupted ; oftentimes, like the product of inoculation, terrifically rapid, from the period of its attack to that of its surely fatal termination. The horse seems unwell, has manifestly lost the bloom on his coat, is unusually dull in his spirits and movements, does not feed with his ordinary appetite, evinces a sparing discharge from the nose of an unhealthy character, with submaxillary tumefaction, and this is followed by swelling of the nostril, chancrous ulceration, augmented and inspissated discharges, and appearances of farcy ; symptoms which day by day increase and extend, and at that rapid rate, that puts an end to life even so early as the second or third or fourth week, through the extreme irritation occasioned by the suffocating effects of the enormous tumefaction of the nostrils, and the clogging of their apertures from the inspissation and scabbing of the discharges within and around them. In this last stage of the acute disease the patient becomes so much an object of pity and compassion that it is but rarely he is suffered to live on to the last. Every breath he takes he draws with the utmost difficulty through his contracted nostrils, all but plugged up with the matters lodged in them, and the noise he makes in drawing his breath hard through these accumulations is very distressful to a bystander ; at the same time there is something in the sound, as I stated before, so peculiar to the ear of the experienced vete-

rinarian, that the moment he hears it, before even the patient's stable-door be opened, he recognises it as the nasal *râle* of a glandered horse.

INOCULATED GLANDERS, I repeat, may be regarded as a genuine specimen of the *acute* variety. The common course it takes, already described after inoculation within the nose, is in the following case shown modified by inoculation in other parts :—

May 3d, 1828.—An ass was inoculated in both upper eyelids, both sides of the loins, the off side of the withers, and on the inside of the ala of each nostril, with the discharge from the off nostril of a grey gelding, purchased by Sir P—— D—— three years previously, who was affected with this same glanderous discharge at the time of purchase, and which had continued ever since.

7th.—All the wounds suppurating, except those on the nostrils, which appear to be healing.

9th.—Absorbents inflamed from the ulcers on eyelids and back.

14th.—Absorbents much thickened, having diffused inflammation about them, and at different parts of their course circumscribed tumours suppurating; the inflammation from the ulcers of the loins proceeding to the groin, that from the off side of the withers to the breast, and, on the eyelids, producing small fluctuating tumours on the jugular vein, just below the ear: the *alæ nasi* were beginning to swell, and there was a snuffling in breathing, &c.

19th.—The *alæ nasi* much thickened, copious discharge from nostrils, and the swelling increasing.

22d.—Respiration greatly embarrassed. He died on the following day.

Examination.—Much frothy spume in trachea—general infiltration of lungs, which were inflamed—considerable consolidation of the anterior and inferior portion of right lobe—wartlike exulceration of Schneiderian membrane of both nostrils to a greater extent than I had ever witnessed before.*

TYPHOID GLANDERS, as the continental veterinary surgeons have named the worst or most malignant form of the acute, is that variety in which deep and extensive sloughing is going on in the cartilage of the nose and turbinated bones, occasioning dark-coloured, in some instances black discharges, at times mingled with blood, having a most disgustingly fœtid odour, with the lungs in a state of abscess, from ripened tubercles

* From the Posthumous Cases of the late Mr. John Field.

running one into another, or, from their infraction having taken place some time before, in a state of actual ulceration. In such a horrible state of disease as this, made still worse by accompanying farcy tumefactions in various parts of the body, nothing can exceed the spectacle of loathsomeness and distress the patient presents. Even death itself seems preferable to such a state of suffering. The subjoined case, which was sent to *THE VETERINARIAN* for 1842, by Mr. Ernes, V.S., Dockhead, Bermondsey, is valuable, because it shows that now and then typhoid glanders assumes a character our French brethren designate by the epithet *charbonneuse*.

On the 16th of October, Mr. Ernes was sent for to see a horse that did not feed well: the horse was dull, unthrifty, and off his appetite. A prescription was given, and, after a few days, the horse resumed his work. On the 3d of November, complaint was made that the horse had a discharge from his nose: it was from the left nostril, and of a very suspicious character. Pimples were seen on the mucous membrane, towards the inner canthus, and on the septum nasi, about the size of a pin's head, and of a yellow red colour: but no ulceration was perceived. The submaxillary lymphatic gland of the same side was also slightly enlarged and hard. Mr. Ernes condemned the horse as glandered, and ordered him to be separated from the others. In the course of the day his hind legs swelled, the swelling extending to the sheath and posterior parts of the abdomen. On the 4th, these swellings had greatly increased, but the nasal discharge had ceased. On the 6th, the swellings had still farther increased, and were reaching towards the neck, shoulder, and lower parts of the head. There is a copious discharge from the left nostril, and the membrane, free from ulceration, is of a blackish hue. On the 8th, the swellings had increased to such an enormous size—the nasal discharges being copious, mingled with blood; the nasal membrane sloughing; the dyspnœa so great, &c.—that an end was put to his life.

Autopsia cadaveris.—The effusion in the swollen parts proved of a *black* colour, resembling oil-paint, very sticky, and of considerable consistence. The membrane of the nose was one mass of gangrene, and in many parts covered with the same black substance that was found in the swellings. The lungs were a complete mass of ulceration, and of the same black hue. The abdominal viscera were all of a dark colour. The mucous membrane was healthy throughout, accounting for the absence of diarrhœa, which is a frequent complication of this disease.

PULMONARY GLANDERS is an appellation that may well be given to that variety of the acute disease which supervenes on

the sub-acute and even on the chronic species, whenever the lungs, in which the disease has been, either unceasingly or in relapses, creeping on all the while, have arrived at a point of disorganization to fail in their functions, and so to create constitutional irritation.* So long as the glanders remains chronic or inactive in the system, months, years even, may pass away without any material change : the moment, however, anything occurs to derange the health, the disease reappears in all its virulence, and then speedily runs on to the destruction of the patient. In many of these cases, however, symptoms of failure will a long while be apparent before the final break-up arrives : the glandered horse will be daily observed to lose his usual health and spirits, his coat no longer of healthy aspect, will draw out, and he will perceptibly fail in his strength, and fall away in his condition. All on a sudden, a fresh eruption of discharge will show itself from his nose, the membrane will be found to have changed colour, the glands under his jaw to have become augmented, his hind legs swollen, farcy broken out perhaps all over his body, acute glanders and farcy, in fine, displayed in all their virulence, to end before long, in despite of anything that can be done, in the destruction of life : not, however, as I have so recently described, through suffocation, but through consumption of the lungs by the disease, assisted by a wearing hectic sort of fever, the same as is seen in human *phthisis pulmonalis* ; and, moreover, bearing a resemblance to that mode of ending life, inasmuch as the brute, as well as the man, retains his senses to the last.

EPIDEMIC or ENDEMIC GLANDERS amounts to nothing more than extraordinary prevalence of the disease among horses in general, or among the horses of some particular locality, referable either to some peculiarity in the breed of the horse, or in the soil or air of the place he inhabits. So far, however, as *causes* are concerned, they will become matter of future consideration : all that we have to consider in this place is the question of difference, if there be any, between the epidemic disease and ordinary glanders. I believe the former

* I have more than once remarked that the disease has confined its ravages to the lungs of the side correspondent with the affected nostril,

almost always to assume the acute, generally the acutest form ; nay, in many instances the typhoid or malignant type : farther than this I know, of my own experience and reading, no difference between epidemic or endemic and common glanders. In the *Compte-Rendu* of the Royal Veterinarian School at Alfort, for 1841-2, we find it stated, that “ the number of animals affected with glanders during the last year has been so considerable, that glanders may be said to have prevailed, and still prevails, *as an enzootic*, in all the environs of Paris. It has principally appeared among the horses employed in the fortifications, who have suffered severely. The form under which the disease has oftenest shown itself is *an acute one*.”—*Veterinarian for 1843*.

SUB-ACUTE GLANDERS is the variety of most ordinary occurrence. It commences with the usual signs—slight or otherwise—of indisposition ; and the disease may—though the circumstance is a rare one—in the first instance assume the acute type. Instead, however, of continuing its rapid course, even after ulceration has displayed itself, both the inflammatory and ulcerative processes subside down to a state almost of total inactivity ; the Schneiderian membrane grows pallid, acquires a leaden hue, and the ulcerations upon it lose their prominent red-streaked borders, and exchange their rugged bleeding bases for comparatively smooth and livid bottoms, throwing up a glass-like reflexion from the lymph matters covering them. It is evident, the moment the nose is inspected, that the disease exists in the sub-acute form : how long it may continue so is very uncertain ; it will not visibly impair the health, nor affect the appetite or spirits, so long as it does so remain ; the moment, however, anything occurs to derange the health, or even after a certain time—after a month or two, or three—without any apparent superadded cause, we may expect the acute disease to supervene, and then the destruction of the patient’s health commences, and speedily is consummated in the manner already described. Though there be an evident cessation of the external disease, however, we are by no means certain that the inward organs—the lungs in particular—are not all the while affording a nidus for its spreading : in most cases it is probable this does happen, inasmuch as, whenever death

has followed from the supervention of the acute disease, we find those organs in a state of tuberculous disorganization. It is this apparent cessation of the glanders outwardly, and the interval during which the disease continues in abeyance, that has afforded opportunities to experimentalists and hunters-after-a-cure to make trial of their various nostrums; and it is the topical influence some of their remedies have had upon the secretions, and even upon the ulceration, of the nasal membrane, that has led so many persons to believe at various times—myself among the number—that they have discovered the veritable antidote: no sooner, however, has the fire which has all along been smouldering within the lungs or head broken out and shown itself outwardly in the display of acute glanders and farcy, than the glittering bubble of a cure has burst, and our darling remedy has to share the fate of those who have gone before it.

CHRONIC GLANDERS, properly so called, consists simply in a discharge from the nose, oftener from one nostril than from both, accompanied by enlargement of the correspondent sub-maxillary lymphatic gland or glands. Symptomatically, it differs from the acute and sub-acute diseases in the absence of anything like inflammation or vascular injection, or chancre, or in fact of any perceptible change whatever in the aspect of the Schneiderian membrane denoting morbid activity: all is as usual in the appearance of parts, and in the animal's health and spirits and appetite; nothing whatever seems amiss, save the flux from the nose and the submaxillary tumefaction. And in this state, as I have so recently observed, the horse may continue for years.* Pathologically, also, it differs from the acute and sub-acute disorders in having for its especial seat the membrane lining the sinuses of the head.† It is possible a chronic

* As is exemplified in Mr. Field's case of Sir P. D.'s horse, given at p. 183. The disease—which turned out to be chronic glanders—had been known to have existed *three years*: how much longer does not appear.

† Some veterinarians assure us a slight prominence is to be felt over the frontal sinus; and that tenderness when the part is tapped is evinced by the patient; also that the sound elicited by tapping with the knuckle is dull and obtuse to what it is in the healthy condition. For my own part, however, I cannot say I have ever derived much information from these (fallacious) tests.

discharge may proceed from the nasal membrane : I believe, however, that it rarely does or continues so to do for any length of time without some discoverable change in the aspect of that membrane ; and that, although it is quite possible such a case might, at first, be supposed to be chronic glanders, a little time would suffice to show whether it really were so or not. If it be chronic glanders, having for its seat the nasal as well as the frontal membrane, or to the exclusion even of the latter—a very rare case I believe—sooner or later we shall detect the *miliary* ulceration, the only ulceration present in this form of disease, and therefore one truly characteristic of it.

Chronic glanders appears sometimes as the sequel of other diseases in the air-passages and lungs ; it is more commonly, however, an idiopathic disease, and one that differs, as much as one variety of disease can be different from another, from the acute and sub-acute affections : between the latter there is but a difference of intensity, whereas the former, be it remembered, exhibits pathological differences. It mostly attacks its victim in a mild and masked form. The horse is thought to have caught cold, and no suspicion, perhaps, is aroused to the contrary until it comes to be discovered that this “cold” is lasting a great while longer than it ought to endure, and that it has resisted all the common means of cure. The horse’s spirits and looks and appetite are not in the slightest degree impaired ; he works—or would work—as cheerfully as ever ; but all the time he has a discharge from one nostril, with an enlargement of the submaxillary lymphatic gland or glands of the same side. And although the nasal issue may be of a nature of itself to excite suspicion, and the enlargement may be such as appears to strengthen or confirm this suspicion, yet do cases incipient in their nature too often present themselves, in which it is impossible for any practitioner, from these appearances alone, to determine at once on the nature of the attack. Give time, and the veterinary surgeon, by watching the progress of the case, will be enabled to solve the mystery, and at length to demonstrate beyond any doubt the real nature of the animal’s ailment.

INSIDIOUS GLANDERS.—Under this happily-chosen appellation, my friend and schoolfellow, Mr. James Turner, has, in a paper he read to the Veterinary Society on the subject, in 1830,

described, with his usual accuracy of observation, the stealthy signs by which we may apprehend the approach, or rather suspect the existence of chronic glanders in its early or masked form. He with truth characterises it as commencing "in a watery discharge from one or both nostrils, more frequently from one only, generally containing particles of mucus or pus, at other times assuming the appearance of both; invariably in small quantities, but never entirely ceasing, either by night or day, at rest or in motion;" accompanied by "an indurated submaxillary gland, enlarged only to the size of a pea or horse-bean; frequently loose, and not adherent to the jaw-bone, and, therefore, presenting no characteristic symptom of the disease more than we usually meet with in incipient catarrh." In support of the paper, Mr. Turner adduced the following instructive—

CASE OF INSIDIOUS GLANDERS.

"A few years ago, a respectable farmer solicited my opinion respecting a hackney mare which he had had some time in full work; telling me that he did not know there was anything amiss with her, but wished her to be examined. She was about seven or eight years old, in excellent condition, and had a good coat. The farmer directed my especial attention to the head, saying that there had been a discharge from the off nostril for a considerable time, but in so slight a degree as scarcely to be considered worthy of notice, especially as the mare was not *jugged*.* There was, however, an enlargement of the gland about the size of a tick-bean, and quite loose. If my attention had not been particularly directed to it, I might have passed it over as not of much importance. I found that the farmer had had the mare seven or eight months; that the discharge had existed during the whole time; and that he had kept her away from the other farming horses. The farmer wished for a decided opinion respecting her. I replied, that the mere circumstance of the discharge having existed for so long a time, led me to suspect she never would be perfectly sound, and that the farmer would not be justified in sending her into the market. She was immediately taken to a slaughter-house in the neighbourhood. While arrangements were making with the collar-maker, a farrier interfered, and purchased her for three pounds, and triumphantly rode her up the town, and declared, in no measured terms, that I had committed a grand blunder, and that he should make a 'complete cure of her.'

"Five or six weeks afterwards I was told that the farrier had nearly 'cured' the condemned mare. I replied, that, if he had only *nearly* cured her, I under-

* A cant term for enlarged submaxillary glands.

stood the state in which she was. A month after this, I was examining the post-horses at an inn near London, when I was told that, by some collusion between the farrier and the ostler, she had been sold into their stables, and was in excellent condition. On closely examining these post-horses, I detected two cases of glanders, and two of farcy without glanders; *and this in a stable that had been occupied by post-horses for many a year, without a single case of farcy or glanders.* On discovering this, I ordered the black mare out, saying that if I found her perfectly free from discharge, and with no enlargement of the submaxillary glands, I would not accuse her as the cause of all this mischief. She was precisely in the same state as when I first saw her. *The first horse that failed was her own partner, and the next stood in the same stable.* Those about the stables were so much mortified by this discovery, that the mare was immediately afterwards smuggled away; the infected horses were also removed, or died. Proper precautions were used with respect to the stables, and no further disease appeared."

A CASE SOMEWHAT ANALOGOUS, WITH A RESULT ALTOGETHER DIFFERENT, I shall select out of my own practice, with a view of showing, by the two being placed in apposition, the risk the veterinary practitioner runs of being deceived in any opinion he may inconsiderately or rashly give at the commencement of the malady.

A grey mare, cutting her four-year-old teeth, was brought to the First Life Guards as one of a lot of recruit horses, and was by me examined and passed as sound and fit for the service. The day after she had been examined, the corporal who had charge of her together with the others—an attendant and observant man, and well acquainted with the habits of young horses—reported to me that the grey mare had that morning been discharging blood from her off nostril. I immediately inspected the nostril, and found some few small coagula about the ala, with a streak of blood upon the septum, which had also coagulated, there being then no blood actually flowing. The mare was particularly shy about the head, on which account it was thought by the men, and for the moment listened to by me, that she might have struck her nose or head. The third day, in place of blood I found some appearance of matter, very scanty, but of a yellowish tinge, accompanied by an indistinct feel of lumpiness under the throat. I had her removed into a box by herself. The fourth day the discharge had augmented, and become muco-purulent, with an admixture of serous liquid, but there was no increase of the submaxillary tumefaction—or what was taken for such—nor were there, nor had there been from the commencement, any signs of indisposition, unless occasional cough could be so considered. The mare fed well, was full of spirits, and would hardly suffer any one to approach her; in fact she was so shy, particularly about her head, that it was deemed inadvisable to attempt to administer any medicine to her; nor

was I desirous that any should be given her, being anxious her ailment should take its natural course. I therefore ordered simply a mash diet and confinement in her box. Two days afterwards the discharge had become considerable; it had the straw-colour hue, and clung about the long hairs guarding the nostril, befouling them a good deal, insomuch that those about her called it "a nasty discharge." The man still affirming that he heard her cough occasionally—though nobody else, it seemed, heard it—I had a stimulating liniment rubbed upon the throttle, but not under the jaw, the submaxillary feeling of lumpiness having undergone no alteration. In this state the mare continued for a fortnight, during which period she kept discharging pretty profusely from the off nostril, without showing the slightest sign of any issue from the near; retaining her appetite and spirits, and only coughing now and then, without showing any sign whatever of soreness of throat with it. During the third week I had her nostrils steamed with the vapour of hot water, with a view of eliciting a more copious discharge, and it appeared to have that effect; at the same time I ordered her diet to be changed from bran-mashes only to two feeds of corn, daily. On the eighteenth day her discharges, which under the operation of the steaming had first been augmented, were evidently reduced in quantity; on the nineteenth, a further reduction was perceptible; and on the twenty-first she was free from any running whatever; in fact, she was in appearance quite well again, though still (according to the man's account) keeping the occasional cough.

The foregoing case is instructive to us from its showing how closely *coryza* or simple catarrh (which it was), may resemble insidious glanders, confined as the nasal flux was during the whole while to one side: the attendant cough, however, though it was but occasional, was favorable, and moreover there was no very distinct glandular tumefaction. The unfavorable symptoms being, the hæmorrhage from the nose, the offensive character of the discharge at one time, and the continuance of it from one to the exclusion of the other nostril.

IN DURATION hardly any disease can be more uncertain than chronic glanders. It may continue, simply as a discharge from one nostril, accompanied by submaxillary glandular enlargement, with very little or unimportant variation in either, for months—nay, for years; on the other hand, it may run in to the acute in as many weeks. Any person, therefore, having a horse of this description in his possession can at no period say how long it may be before the disorder may show itself in an active, nay, rapidly destructive form. In some cases the nasal flux, as I said before, runs for a long period with but slight or

unimportant alteration ; in others, in quality as well as quantity, it exhibits most remarkable fluctuations ; at one time appearing so scanty and trifling as hardly to be worth notice ; at another, pouring forth in all the abundance of the eruption of pent-up channels, bringing in its current matters solid as well as fluid, from the admixture of lymph with muco- or sero-purulent flux, and all of the most fetid nature, in consequence of having been shut up for a longer or shorter period, and so undergone a putrefactive fermentation, within the sinuses of the head. Its colour is very variable, depending upon the nature of it, and upon the time it has been retained within the sinus : it may be white, yellow, green, brown, black, according to circumstances ; its colour being often a sort of guide to us in respect to its composition and probable duration under confinement.

A DISTINCTION must be made, however, between chronic glanders and what we are in the habit of calling *nasal gleet* ; an affection some horses are known to have either all their lives, or at certain periods of them. We must not set down every horse that comes to us for having had for any length of time, either (more or less) constantly or only at times, a flux from one or from both nostrils. The membrane clothing the nasal chambers and sinuses of the head is, the same as other mucous membranes of the body, liable to derangements in its functions—to secrete too much or too little, or not of the proper quality ; and therefore the same as the membrane of the human urethra, it may become the source of gleet, and of gleet of so long duration that in time it becomes, as it were, habitual, natural to the secreting apparatus. This is the only way in which we can account for horses having, at times, discharges from the nose all their lifetime ; and yet they work, never showing any glanders : indeed, to those acquainted with them, causing little or no alarm. The important question for us to consider is, how are cases of nasal gleet to be distinguished from those of chronic glanders. In all the cases I have seen, with no exceptions that I remember, though I do not deny there may be some—the discharge has consisted of an unusually white mucous or sero-mucous matter, and in several instances has been remarked to be grumous or lumpy. There is in general no en-

largement under the jaw ; and in this circumstance, as well as in the white mucous and grumous nature of the discharge, together with the history of its origin, when that can be obtained, may be found pretty safe ground of distinction between nasal gleet and chronic glanders.*

Beyond any information we can glean from the symptoms, and such as is to be derived from the history of the case, we have no means of testing its true nature save through an operation, or by inoculation of an ass (or another horse) with the discharged matter. Of these tests we shall speak hereafter.

THE UNAFFECTED GOOD HEALTH horses having chronic glanders in general enjoy, together with the condition and apparent aptitude for work they maintain, it is that has given rise to a fraud often successfully practised at Smithfield and other horse markets, in days when glandered horses were more common in the country than they are at the present time. Three knaves act in confederacy. The horse, who previously has been made by some sternutatory means to blow out any matter that might be lodged in his nose, is by one of them led to the market for sale, where he is soon sold at a price much below his apparent value, the purchaser having been persuaded and urged on by a stander-by—a seeming stranger—who is no other person than the second confederate. Pleased with his bargain, the purchaser takes him away homeward ; but has no sooner got clear of the market than he is met by another stranger—the third confederate—who happens to recognise the horse, and who at once expresses surprise and dismay that he should have bought an animal with such a foul and horrible disease upon him ; adding that the horse ought to be, and must be in obedience to Act of Parliament, shot without delay ; and in order that the purchaser may not be at any farther trouble or responsibility, offers at the same time for a small fee to take the horse of him “at knacker’s price.” In this way the subject of fraud finds his way back into the hands of his former possessors, and is soon offered again for sale ; not perhaps in the same market, but in some other part of the country. The late Captain Harvey—a gentleman well known as one of the best riders in the Old Surrey hunt—was cheated in this manner at Bromley

* For an account of nasal gleet, see vol. ii, p. 24-28.

Fair : in his case there was no third confederate. The Captain thought he had got an excellent hunter for very little money, with the trifling drawback of his having "a slight cold in his head," and brought him the following day to my father for his advice. The opinion sought proved short and decisive ;—the horse was "glandered."

The following narrative, taken from the Report of the Suppression-of-Cruelty Society, will confirm what I have been saying by way of premonition to the unwary :—

A gentleman passing through Smithfield Market on Friday the 23d inst., observed a man running a very good-looking bay mare up and down the market. It struck him that the mare would answer his purpose, and he asked the price ; and was told by the owner, who seemed to be a countryman, that he would take fifteen sovereigns for her, and not a farthing less, and that he would warrant her sound in wind and limb, and in every respect.

The gentleman wished for a reference, and the name of a person at a distance, of whom he knew nothing, having been given, he expressed dissatisfaction, and asked whether there was any one in the neighbourhood who would answer for the character and integrity of the seller. "Oh, yes," said the countryman ; and he led the way to a public-house in Smithfield Market.

On entering the house he asked the landlord and another person at the bar whether they knew the countryman, who stated his name to be Brown ; to which they replied in the affirmative, and that he was a perfectly safe man to deal with. The bargain was then concluded, and the fifteen pounds paid. A man to lead the horse was easily procured, and he departed with his bargain.

He had, however, scarcely got as far as Snow-hill, when he was surrounded by a crowd of fellows, who told him that he had bought a glandered mare, and offered to rid him of his bargain for a certain sum ; he, however, would have nothing to do with them, but took the mare home, and, sending for his veterinary surgeon, found that he had indeed purchased a glandered animal, and that there was no help for it. Some ill-looking fellows afterwards came to his yard, and offered to purchase the mare, and he, ashamed of his bargain, sold her to a butcher-looking fellow for seven pounds.

He went to the next market, and learned that it was quite a common thing to sell glandered horses, re-purchase them for a small sum, and sell them again to new flats. While he was talking, he saw the same identical mare with which he had been duped run up and down for sale, and he heard eighteen pounds asked for her.

He immediately started in search of the police, but on his return the mare and her professed owner and purchaser had disappeared. He went immediately to the police office, and stated all the circumstances, adding that he had no desire of obtaining redress himself, but he wished to put an end to such rascally

proceedings. The publican was sent for; he owned that he knew a person of the name of Brown, but not where he was to be found; and as for the circumstance alluded to, he had no recollection about it. The magistrate ordered him to appear again on the 26th, and to bring with him the man who was at his bar when the transaction took place; observing that a most villainous conspiracy had long been carried on in Smithfield, which the magistrates were determined to put down.

THE CAUSES OF GLANDERS

MAY be considered under the general heads of PREDISPOSING and EXCITING.

PREDISPOSITION may lurk in *breed*, in *constitution*, in *age*; or it may be generated through the influence of *soil*, *climate*, *aliment*, &c.

BREED, we have, I think, pretty satisfactory evidence, carries with it predisposition to certain diseases: to use a vulgar but expressive phraseology—"they run in the blood." Periodic ophthalmia is, perhaps, the most striking instance of this;* roaring, according to many authorities, is another.† Whether glanders or farcy can be ranked in the class of hereditary maladies I am not prepared to say: LEBLANC hesitates not to assert that it can. I should certainly give it as my opinion that inasmuch as tender or delicate

CONSTITUTIONS are inherited by horses, to the same extent they become predisposed to certain diseases—to those in particular affecting the respiratory organs, and with these to glanders; and the same appear to be the notions of Dupuy, when he informs us that the "lank, ill-conditioned horse, the one that is soft in constitution, and soon knocked up at his work," is the subject the most likely to breed or contract "the tuberculous affection," as he calls glanders and farcy. Furthermore, a constitution originally strong and resistant may be reduced to a weak or "ill-conditioned," susceptible state, by bad keep, over-work, exposure to cold and wet, &c.; or through the failure of any of its principal organs, especially of the lungs. Constitutional predisposition may, therefore, prove to be either *natural* or *acquired*.

* See part i, vol. iii, of the 'Hippopathology,' p. 90, et sequent.

† See vol. ii of the 'Hippopathology,' p. 49.

AGE, we well know, has considerable influence in predisposing horses to take disease of the air-passages—to take *catarrh, bronchitis, strangles, glanders* : we have no reason, however, to suppose that this influence is operative in the case of glanders *in particular* ; for the same reason that a young horse is more likely to catch a cold than an old one, for the same reason, should he go within the reach of the exciting causes of glanders, he may be considered as especially predisposed to that disease. Out of forty cases of farcy and glanders occurring in the Ordnance, under the superintendence of my father, and, latterly, of myself, the ages of which happen to be registered, one was three-years-old, one four-years-old, four five-years-old, six in their sixth year, six in their seventh, six in their eighth, five in their ninth, eleven ten-years-old and upwards. Consequently, so far as this brief account goes, the adult and middle ages appear to suffer most from the disease.

Certainly, at no age are horses to be regarded as exempt from taking glanders. LATOUR relates the case of a foal that exhibited discharge from the nose and enlarged glands under the throat at its birth, which, in ten days afterwards, was followed by ulceration. LEGAND, the V.S. to the Tenth (French) Chasseurs, has also given, in the *VETERINARIAN* for 1828, an account of a glandered mare that brought forth a foal free from disease at birth, but which eight days afterwards commenced running at both nostrils, and on the sixth day after that (the fourteenth from its birth) died from suffocation. A horse belonging to the Artillery, destroyed for glanders in the year 1816, was twenty-four years old. Another, a very fine, old, milk-white horse, a great favorite with Colonel Quist, at that day in command of the Riding-House Department at Woolwich, was shot on account of glanders in 1818, after a servitude under the colonel of sixteen years, and being supposed to have completed the twenty-fifth year of his age. Aged horses labouring under chronic disease of the lungs are very apt to have glanders and farcy break out and put an end to their days : indeed in such subjects it almost appears as one of the ordinary modes of terminating life.

The following statistic of a French cavalry regiment, which

we glean from D'Arboval,* is instructive on this head. Out of 134 horses dead from glanders, only five had not attained their fifth year; sixteen being between the ages of five and six, thirty-one between those of six and seven, twenty-seven between seven and eight, the same number between eight and nine, eighteen between nine and ten, and seven only after the age of ten: making, however, altogether but 131 instead of 134. Of 1634 remount horses, most of them five-year-olds, received by another French regiment in the course of eleven years, 396 were lost from glanders, viz. six three-year-olds, forty-five four-year-olds, ninety-eight five-year-olds, ninety-seven six-year-olds, ninety-nine seven-year-olds, and fifty-one eight-year-olds. In a third French regiment, the total number of glandered horses during a period of nine years amounted to 167, of which the ages of 111 varied from five to nine years.

These statements tend to confirm the deduction I ventured to draw from my own comparatively limited experience, that glanders was especially a disease of the adult and middle ages; at the same time they appear to put us in possession of another important fact, which is, that the mortality from glanders in the French cavalry is much greater, in proportion to the numbers, than it is in our own. Of British cavalry regiments serving in England, Scotland, and Ireland, whose combined strength may be, in round numbers, computed to be 5500 horses, I am informed by the principal veterinary surgeon, Mr. Cherry, there have been thirty-two horses destroyed for glanders, and fifteen for farcy, in two years and a half. In my own regiment, as I said on a former occasion, glanders has shown itself but once during the seventeen years I have served, and that happened under peculiar incidental circumstances.

IN RESPECT TO CLIMATE AND SOIL, it would appear that glanders is a rare disease in cold and one absolutely unknown in hot climates, in Arabia and Africa, to which, I believe, we may add India; my cousin, Mr. Charles Percivall, having informed me that, during his eight years' residence in Bengal, while serving in the 11th Light Dragoons, quartered at Meerut and Cawnpore, he had not seen a single case either of farcy or glanders. M. Saunier, veterinary surgeon to the King of

* 'Dictionnaire Vétérinaire;' under article "Morve."

Portugal, assured Dupuy that no case of glanders had occurred, to his knowledge, during the thirty years he had been living at Lisbon. This was prior to the occupation of that country by British troops. At the time of the Peninsular campaign everybody in our army knew that both farcy and glanders prevailed to a great extent, and particularly among the mules that were in our employ as bat animals. To what such dread changes were owing—why a country at one time said to be free from any such disease should, some years afterwards, become, as it were, the very focus of contamination—is a fact which, if I mistake not, may prove of some importance to us in the investigation we are about to make into the *exciting* causes of glanders.

WET AND COLD are at all times prejudicial to horses' constitutions, and especially to those either very young or very old; and though the better their feed the less they are likely to suffer under such exposure, yet will these agents predispose and be very apt to lay the foundation for pulmonary, mesenteric, and glandular disease, which, in the end, will produce farcy and glanders.

Before we proceed to the consideration of the second class of causes, viz.

THE EXCITING CAUSES, it will be well for us to inform ourselves of the opinions of such veterinary writers, foreign as well as British, as appear to have paid much attention to the subject, and particularly to that all-important branch of it, *contagion*; a branch which, at one period of time, has had supporters on all sides, while at another it has been left almost without any. These I shall arrange in the order of the date of their respective works.

SOLLEYSSELL, 1669, pronounced glanders to be "the most contagious distemper to which horses are obnoxious; for not only," says he, "does it communicate its venom at a small distance, but it *infects the very air*, and seizes on all horses that are under the same roof with him that languishes from it."—"There are (however) *several kinds* of glanders, *some of which are not so extremely infectious* as others; though there are none that ought not to be suspected."*

* 'The Compleat Horseman:' Hope's Translation, second edition, 1717.

DE SAUNIER, 1734, regards glanders as highly contagious; and commands that the mangers, racks, &c. of glandered stables be destroyed. He thinks there are forms in which the disease is communicable even at a considerable distance.*

LAFOSSE, *senior*, 1749, is said to have been a non-contagionist; and, so far as making out seven kinds of glanders and admitting but one out of the seven to be contagious, he certainly was so. This one contagious species of his, it must, however, be remembered, was *farcy-glanders*; the very species we of the present day call true or confirmed glanders; and so, according to these views, Lafosse did not deny the contagiousness of glanders, although he held the opinion that the disease rarely arose out of such a cause.

BOURGELAT, 1765, the founder of the French Veterinary School at Lyons, evidently entertained notions opposite to those of Lafosse. He thought that horses exposed to contagion did not at all times take the disease. His words are, "according to the acridity of the virus of glanders, as well as according to the greater or less disposition of the sound horses to take it, will be its contagious effects; and sometimes no such consequences will follow." This opinion, remarks Gohier, from whom this account is taken, is conformable to the observation of the present day.†

GUERINIERE, 1769, concurs in belief with Solleysell, that glanders may readily be propagated within stables through the medium of the atmosphere.‡

GARSALT, 1770, is of opinion that the malady will be caught by licking the discharges from a glandered horse.§

DUTZ, 1773, a Dutch veterinary writer, published some observations leading to the inference that the contagiousness of glanders was matter of doubt.

LAFOSSE, *junior*, 1775, was an affectionate copyist of his father.||

* 'Parfaite Connoissance des Chevaux.'

† L'Abbé Rozier's 'Dictionnaire d'Agriculture Pratique.'

‡ 'École de Cavalerie, contenant la Connoissance, l'Instruction, et la Conservation du Cheval,' 1769.

§ 'Le Nouveau Parfait Maréchal,' 1770.

|| 'Dictionnaire Raisoné d'Hippiatrique,' &c., 1775.

VITET, 1783.—“Should a sound horse be made to live with one virulently glandered, he would soon take the disease. In mules the disease makes great ravages, and is readily communicable. It is more contagious in summer and in hot stables than in winter or out-of-door situations. Some farriers think a horse cannot take the disease without mediate or immediate contact; others maintain a contrary opinion, saying they have witnessed foals glandered who have never been near an infected horse. In such a case, might not the farrier or groom convey the disease? It is sufficient for its transmission that a man or a dog touches the glandered subject. Even the air may, within a certain distance, prove the medium of contagion. There is, however, reason to believe, from an infinity of experience, that the poison of glanders is not communicable, save through its coming into immediate contact with the membrane lining the bronchial tubes, through air charged with the glanderous molecules, or through eating or drinking. Introduce glandered matter into a wound in the skin of a horse in good health, and he will not turn glandered.”*

VOLPI, Veterinary Professor at Milan, makes the bold assertion that glanders “is caused by contagion alone;” and adds that “the opinion of those who pretend that this formidable disorder is not in its commencement contagious, but may become so during its progress, is certainly erroneous. This opinion has led some young veterinarians to believe that glanders is not contagious; and I know one,” continues Volpi, “who, coming to a regiment impressed with this notion, neglected to segregate glandered horses; and the consequence was, the disorder became general.” “A troop horse that had a cataract, but was in other respects sound, was sent to the Veterinary School at Milan, to have an operation performed on his eye. The horse was put into a stable along with some glandered horses, the disease not being, by the operating surgeon, believed to be contagious. After the result of the operation was known, the horse was returned to his regiment, and, in about two months from his joining, became glandered.”†

WHITE, of our own country, a man who bestowed a good

* ‘Médecine Vétérinaire,’ vol. ii, 1783.

† Taken from White’s ‘Treatise on Veterinary Medicine.’

deal of pains on researches into the causes and nature of glanders, tells us, "Volpi is the only author he has met with who asserts that both glanders and farcy originate in contagion *only*. I have long," he continues, "held this opinion." And in another place: "It is now twenty-six years since I have been devoting a considerable share of my attention to this subject."*

PROFESSOR GOHIER, of the Royal Veterinary School at Lyons, in 1813, from some experiments he instituted with a view of ascertaining in what different ways glanders could be communicated, received the following results:—

"Firstly: that of two horses, a mare, and three asses, upon whose pituitary membranes glandered matter had been smeared or injected; in the three asses glanders appeared from the sixth to the ninth day—and that one died on the tenth, one on the eleventh, and the other on the fifteenth day; that one of the two horses had tumefied submaxillary glands on the fifth day and chancres on the thirteenth, but without discharge; and that the other had swollen glands on the fourth day, which, by the eighteenth, had been followed by confirmed glanders: lastly, that the mare had swollen glands on the fourth day, and, on the ninth, chancres; and that both remained stationary until the twenty-ninth, the day on which she was destroyed.

"Secondly: that of two horses, two mares, and two asses, placed in communication with animals confirmedly glandered, both horses escaped contamination, although one had been there a month, the other two months; but of the two mares, one showed symptoms of glanders on the tenth day, the other on the twelfth day; the disease making progress in the one, tardy in the other. Of the two asses, one became glandered on the eighteenth day, and perished on the forty-first; the other remained a month in the stable with the glandered horses without manifesting any sign whatever of having caught the disease.

"Thirdly: that of two horses, a mule, one male and two female asses, on whom were put halters and clothing taken off glandered horses, and who wore them from six to fourteen days,

* 'A Treatise on Veterinary Medicine,' seventh edition.

one of the two asses presented on the fourth day well-marked symptoms of glanders, of which it died on the sixth, but that the five other animals escaped contamination.

“Fourthly : that of two horses, a mare, a mule, and an ass, upon the borders of whose nostrils, and upon the sides of the necks, the virus of glanders had been inserted, almost all had, where punctures had been made around their noses, spreading ulcerations, preceded by a good deal of tumefaction of the parts, and accompanied by some swelling of the submaxillary lymphatic glands.

“Fifthly : that a mule, three asses, and an ass foal, into whose submaxillary intervals wounds were made, in which were insinuated, and by suture maintained, lymphatic glands, excised from the same parts in glandered horses, not one of them experienced any symptom of glanders ; but the young ass died on the sixth day, from a large submaxillary ulceration, and consequent tumefaction of the parts about the throat, which ended in every symptom of suffocation.

“Sixthly : that of two horses, a mare, a mule, and two asses, into the jugular veins of each of which he injected from a kilogram and a half to three kilograms of blood, drawn from either the jugulars or carotids of glandered horses, not one became affected with glanders ; though they all died from the first to the fifth day after transfusion.”

“One might object, that, as most of these experiments were made on aged animals, or such as were worked down in condition, or reduced from bad feeding, &c., the deductions from them were not equally valid with what they would have been, had the subjects been young, and in the enjoyment of their full strength. There is some foundation, no doubt, for such objections ; but for such experiments we had no other subjects than such as were purchased by the pupils for dissection ; and out of them I made choice of those in best condition, and such as were free from any malady. And further, all such as were selected were, while under experiment, well fed, it being an object to prolong their life to the period desired.

“Neither colour nor sex appeared to have any influence in these experiments. And in all the subjects that became glandered, the discharge has been nearly the same from both

nostrils, with this difference, that it almost always appeared, as well as the tumefaction of the glands and the chancres, somewhat earlier on the left than on the right side of the head.

"THE PRECEDING EXPERIMENTS leave the contagion of glanders no longer a matter of doubt. By contagious matter applied to the nasal membrane, it is proved to be communicable, and more readily to asses than to horses. In other ways, however, such as through cohabitation, the employment of articles or utensils used by glandered animals, or the introduction of glandered matter into wounds made in other parts of the body, the disease is by no means so readily communicable; and as for the transplantation of diseased lymphatic glands and transfusion, the disease does not appear to be producible at all in either of such ways; although, in regard to the latter, some veterinarians have maintained the contrary."*

FROMAGE DEFEUGRÉ, 1815, the presumed author of "Morve," in Rozier's 'Dictionnaire d'Agriculture,'† &c., tells us that he, at one time, "fell into the popular opinion of glanders being a contagious disease, and even went so far as to prescribe means for its prevention: at the present time, however," continues this author, "from a multitude of observations I have made personally, I believe that *glanders is not contagious*. It originates in one horse, as in a great number, from individual predisposition, from aliments, from work, from habitation. I have seen the disease attack a number of horses on a sudden from having fed on damaged hay;" "or having eaten ship corn that has speared, and had afterwards lime mixed with it, to make it appear dry."—"Horses that dealers call *rotten* will also have it;" and "certain waters will produce it;"—"heating aliments, overwork in posting and coaching establishments;"—"catching cold from standing while overheated;"—"immer-

* 'Memoires et Observations sur la Chirurgie et la Médecine Vétérinaires,' par J. B. Gohier, Professeur d'Opérations et de Maladies à l'École Impériale Vétérinaire de Lyon, tom. iii, 1813.

† The article "Morve" has the signature (F) affixed to it in the Dictionary; and from Fromage Defeugré being the only one among the authors given in the title-page whose name begins with F, we take him to be the writer of the article in question.

sion in cold water, rivers, &c.”—“ Sometimes the disease appears as the sequel of neglected catarrh, strangles, quittor, canker, mange, water farcy treated by repercussives. The disease has been known to break out in stables through or near which common sewers or infected streams of water have run.”—“ Marasmus is sometimes the precursor of glanders : it may also arise from wounds penetrating the nasal bones, or frontal, zigomatic, or maxillary sinuses ; from carious molar teeth : though, in this case, it entirely depends upon local lesion.”

DUPUY, 1817, states in one of his corollaries, “ That almost all veterinarians have adopted the idea of contagion ; though some few have advanced an opposite opinion.” And in the one following : “ that I (Dupuy) know of no well-conducted experiments in favour of contagion ; whereas there are some against it.”*

COLEMAN, who barely admitted the contagiousness of glanders, will best have his opinions on the subject set forth, in his own happy way of expressing them, by the following extract from his Lectures.†

“ The disease has been long known to be contagious, to be communicable through the medium of contaminated stables, and by inoculation ; hence it has been concluded that it had no other origin but contamination. Most physiologists, indeed, have supposed that contagious diseases could not arise from any other cause ; and there are certainly some animal poisons whose operation appears to favour this hypothesis ; but, in prosecuting our investigations, it would seem that every such poison is governed in its operation by certain laws peculiar to itself : as different medicines produce different effects, so the different poisons of contagious diseases appear to possess peculiar properties, though the diseases themselves all in common admit of propagation by contagion. There are several diseases affecting the human subject, that, according to general opinion, can only be generated by contagion ; such are syphilis, small-pox, measles, and hooping-cough. When a person has contracted any one of these diseases, it is said that he has been in the vicinity of contagion or infection ; and it may be im-

* ‘De l’Affection Tuberculeuse, vulgairement appelée ‘Morve,’ &c. &c.,’ 1817.

† Published in the third volume of my ‘Lectures on the Veterinary Art.’

possible to prove, beyond all suspicion, the contrary ; but, what was it that *first* bred these disorders? Not contagion ; but a *combination of certain causes* ; and, being once engendered, they became contagious. We have examples of this in jail and ship fevers, and in dysentery : these, once generated, become contagious ; notwithstanding no such cause could possibly give them origin. Itch, the Professor believes, is often produced in the absence of contagion : it is bred in personal uncleanness. Why, then, may not hooping-cough, smallpox, &c., arise spontaneously, *i. e.* from the same causes which originally produced them? Those who are most conversant in the habits and diseases of horses now know, that glanders, although demonstrably contagious, much more frequently arises from other causes : it is a disease that rarely or never spreads among horses at pasture, though a glandered subject may have been grazing among them ; for we learn from experiment that, although the disease is communicable by contact, the poisonous matter must be applied to a part bare of hair, and that, even then, the chances are in favour of the animal escaping infection unless the part have previously been, or happen to be in the act, abraded."

"There are two casual experimental results by which practitioners, in investigating this subject, have suffered their judgment to be misled, and thence have come to erroneous conclusions. The one is, that, because a horse has been subjected without effect to inoculation, *ergo*, the animal from whom the matter of infection was taken cannot be glandered ; the other, that, because the former became glandered, *ergo*, the latter must of necessity have the disease. Two circumstances are absolutely and indispensably necessary for the production of a disease by contagion ;—the application of the poison, and the susceptibility of the animal or part to which it is applied. You may inoculate without success from insusceptibility of the inoculated subject, on the same principle that you may administer the same doses of aloes to two horses, and effect violent purgation in one, but make no impression upon the other. It is by no means uncommon to see persons inoculated for cow-pox and smallpox without effect : the explanation of which is, that they are not susceptible of that degree of

poisonous excitation at that particular period. Again, it has been argued that a disease could not be glanders from which a horse recovered, even though it showed every characteristic outward sign of glanders. But the very groundwork of this position is untenable: the Professor has seen (and so have I) several cases of spontaneous cure from chronic glanders; and evidence may be brought forward of recovery even from acute glanders combined with farcy."

"So far from contagion being the ordinary cause of glanders, the Professor estimates that *not one horse in a thousand, or even in ten thousand, so receives the disease*. The poison of glanders is bred and diffused in an atmosphere rendered impure by repeated respiration, and by gaseous impregnations from the dung, urine, and perspiration, emitted in hot and foul stables. No vital being, neither animal nor vegetable, can maintain life in the total absence of pure air; and, according as an animal is from nature habituated to purity, so, generally speaking, it would seem that he suffers from atmospheric contamination. There are several sorts of vegetables that cannot be grown (at least to perfection) in the vicinity of London, in consequence, we believe, of the impurities continually floating in the atmosphere; whereas, there are animals, such as rats and mice, and we may add bats, who enjoy health in the most confined and noisome situations. Man can withstand a contaminated or poisonous atmosphere, it would appear from his habits, much better than the horse: we join house to house, form villages, towns, and large cities; and we live thus crowded together with seeming innocuousness: still, to obtain specimens of well-grown forms and robust health, we must go into the country and select them from among the husbandmen; for in large and populous towns instances are always presenting themselves of rickets, scrofula, consumption, &c."

"The horse is an animal destined by nature to breathe an atmosphere of the purest kind; in proof of the salubrity of which to him, suffer him to remain in his native fields, and he will live long and ail nothing. But, bring him once into a state of domesticity, place him in a confined situation, in which he is compelled to breathe air that has been already respired, not only by himself but perhaps by other horses also, air im-

pregnated with the exhalations from the urine, dung, and perspiration, and you sacrifice him a victim to malignant and fatal maladies. And none of our domestic animals, no more than horses, can tolerate this with impunity. If poultry are kept in a confined place, they breed what is called the *pip*, which proves a very destructive disease among them. Hogs, under similar circumstances, engender the *husk*, a species of pulmonary phthisis. Even plants, unless they are occasionally supplied with fresh and pure air, will wither away and die in our greenhouses. These morbid consequences arise not from any deficiency in the vital or oxygenous part of the air; for, it is found by experiment, that there is proportionably as much oxygen in the closest alley in London as in that which encompasses the hills of Highgate. No! these deleterious effects are ascribable solely to the animal poisons contained in the atmosphere, which are not only inhaled with the breath, but probably taken in with the food also; be that as it may, however, through one or both these channels the poison becomes absorbed into the system, corrupts the whole circulating mass, and breaks out in local forms in various susceptible parts of the body. Therefore it is, that, in the degree in which a stable is foul and heated, from want of ventilation, we find its inhabitants the subjects of glanders, farcy, ophthalmia, &c. We seldom receive these cases from gentlemen's stables, because in general they are well constructed, and kept clean, and do not contain many horses; but in collieries, breweries, post-houses, coach establishments, &c., where the stables are filthy from the dung and urine which stagnate in cavities in the pavement, for want of proper sewers to carry them off, and where the men are suffered to add to the mischief by plugging up every air crevice they can find, we are continually witnessing the ravages of these very formidable diseases. Farmers' stables, though no better or even worse in their construction, do not appear to turn out so many glandered subjects; a fact that admits of reconciliation with what has been advanced, from the circumstances of their stables being in general very capacious, and many of them in too ruinous a state to admit of exclusion of the external air. The Professor was first led to adopt this notion of the spontaneous origin of glanders and

farcy from an occurrence in our cavalry service which came to his knowledge. Many years ago (I believe about 1796) there was an extensive encampment on Dover heights, from which the horses could not be removed until the autumnal season was far advanced, in consequence of the stables intended for their reception not being in a state of readiness. Now, these stables were newly erected ones, notwithstanding which, great numbers of the horses, though previously in perfect health, soon after entering them, became diseased: the greater proportion contracted grease, but several were attacked with glanders and farcy. He has since also received peculiarly satisfactory evidence of this in two memorable instances, in which stables that were hot and foul, and had from time to time turned out several glandered horses, were rendered equally salubrious with others adjoining them by proper ventilation and attention to cleanliness."

"By this time we shall have received some striking illustrations of what was advanced in the outset, that every animal poison is regulated in its operation by its own peculiar laws: were it not, most wisely, so ordained, the whole animal creation must long before now have been exterminated. *If man had been susceptible of contracting diseases from horses, oxen, hogs, sheep, dogs, &c.*, and these animals, in their turn, could have taken human disorders, all must have lived only to act their dreadful parts in the work of universal devastation."

"We now come to the relation of that celebrated experiment of the Professor's, by which not only the contagious, but the constitutional nature of glanders is proved beyond all doubt and idle speculation—that experiment which goes to disprove the assumption of Mr. Hunter, that *the blood itself was never diseased*. Of a horse affected with acute glanders, the Professor laid bare the carotid artery and jugular of the same side, and round each vessel placed a ligature. A pipe furnished with a stop-cock was then inserted and fastened into the artery, which was made to communicate through the medium of an elastic tube—an *ureter*, I believe—with another pipe introduced into the jugular vein of an ass; this animal having been previously bled until he had fallen from exhaustion. In this manner blood was conveyed from the artery of the horse into the vein of the

ass until the latter evinced signs of perfect resuscitation. A circumstance occurred, however, in the revival of the ass, which, though it did not affect the issue of the experiment, may serve as a warning to future experimentalists; and that was, that in consequence, as it was thought, of transfusing more blood than was requisite, the ass appeared puffed out or swollen in every part of its body: the tumefaction was, however, relieved in four or five days, in the course of which time *the animal became glandered in a most virulent degree*; and to prove that his disease really was *glanders*, other asses were inoculated from this one, and they all, without a single exception, shared the same fate. The blood lost by the horse was not sufficient to deprive him of vitality.”*

SMITH, 1818, as a non-contagionist, stands in the same rank with Dupuy and Coleman. “Having been taught,” he says, “at a very early period of life, to believe that glanders is a disease highly infectious, and holding my preceptor (this could not be Coleman) in great estimation, I received his opinions on the subject with implicit confidence.” Farther, Mr. Smith states in his preface, that, in offering the result of his experience, he has no wish to allure any into fatal security, by inducing them to permit the diseased subject to remain with one that is perfectly free from it.”—The “causes of glanders” Mr. Smith enumerates to be,—I. GENERAL DEBILITY.—II. A PREVIOUS DISEASE.—III. BREATHING AN IMPURE AIR.—IV. EXPOSURE TO A CURRENT OF COLD AIR, OR BEING PERMITTED TO DRINK COLD WATER WHEN HOT.—V. A SUDDEN TRANSITION FROM COLD TO HEAT, and VICE VERSA.—VI. INFECTION. The first three of these Mr. Smith regards as PREDISPOSING CAUSES; the latter three being EXCITING CAUSES. “General debility may be considered as the forerunner of every disease, the system being thereby rendered more susceptible to morbid impressions.” “Glanders is frequently produced by a variety of other dis-

* “No proofs can be more conclusive than those which the Professor (Coleman) adduces of the contagious poison in question affecting the mass of blood, and producing ill-effects through this medium, viz., the production of the disease in one animal by the inoculation with the matter of secretion, and in another by transfusion into its veins of the fluid from which such secretion is formed.” (Travers’ ‘Inquiry concerning Constitutional Irritation.’

cases.”—“I have seen the mucous membrane ulcerated, the bone carious, and all the characteristic symptoms of glanders produced by the cut of a sabre. I have also seen one case in which glanders was produced from the effects of a severe fall, by which the frontal sinuses were perforated. In another, the os frontis laid entirely bare, and the concussion so violent as to excite a copious discharge of mucus and pus from the nostrils: and in another, the same symptoms produced by a blow on the superior part of the nasal bones.” In stables ill ventilated, wherein “a great number of horses stand together, especially in barrack-stables”—“the same air is re-inspired *until it becomes a putrid vapour*, totally unfit for supporting health; and though it is not so entirely divested of vital air as to occasion immediate death, yet, *being in part deficient of this essential principle*, the functions of the secreting organs soon become imperfect: hence succeed languor and debility, the usual precursors of every disease; and, if the cause be not removed, farcy, glanders, atrophy, and death, inevitably follow.” Of the *exciting* causes, “exposure to cold when hot may be considered” one; and this combined with the predisposition induced by “the heat and impurity of the stables”—“perhaps more frequently produce not glanders only, but every other disease that prevails amongst horses in the army.” In respect to “change of temperature”—“I have always,” says Mr. Smith, “found glanders to prevail during a campaign;”—“and I have always found,” he adds, “that when the greatest heat prevailed in the course of the day, the nights cool, and the fogs more copious and heavy, that diseases amongst the horses were also most prevalent.”—Of “infection,” Mr. Smith says, “as only two cases of inoculation with the matter of glanders performed on the horse have fallen under my observation, in neither of which was the disease produced, I do not state this on personal knowledge, but merely suppose it probable, from common report. *I grant that the disease may be propagated by inoculation, and, of course, admit that a glandered horse may communicate the disease to another, when they stand together: but, as I have never seen one case of glanders that could, with any degree of certainty, be traced to infection as its origin*, while, on the contrary, the real cause was generally easily discovered, if not self-

evident, it has long appeared to me, that, *where one case of glanders proceeds from infection, ninety-nine are produced by the causes just enumerated.*" "This will be more manifest, if we consider that *glanders is a local disease*, and cannot be communicated by effluvia, but that *its propagation must be accomplished by the absorption of its virus.* It is very well known that the cow-pox is transferred from one animal to another by inoculation, yet it is universally allowed to be not infectious.* The lues venerea is also conveyed from one person to another by the absorption of its virus; but there is no instance where it has given the infection by a vapour.† And the reason assigned for this is, that it is considered as a local disease, affecting particular parts."—"Now there is no disease incident to an animal that is more local and specific than chronic glanders. I have seen an instance where the surface occupied by the disease could have been covered by the end of the thumb; and in many others, the whole circumference of the diseased surface did not exceed three inches. From this circumstance, and the numerous instances I have seen of horses that have stood with those really glandered escaping the disease, and of others, being affected with it where no infection could possibly be traced, I am decidedly of opinion *the disease cannot be communicated by effluvia*; but that, in order to propagate it, it is necessary that the matter discharged from the nostrils be applied to the action of the absorbents in its most recent state, for which purpose a perforation must be previously made through the skin; and in this way most of the animal poisons, the vaccine virus, the poison of the viper, the saliva of the dog, &c., are introduced into the system; that is, either with the point of the lancet, the teeth of the animal, accidental wounds, or excoriation. If the mucus issuing from the nostrils of the horse be so infectious as it is generally supposed, how is it that those animals which have access to the places where they stand, and in which they are frequently confined, escape the disease?—especially dogs, who also feed on such horses immediately after death, when the noxious influence of the matter retained in the nostrils must be greater than after it has

* 'Edinburgh Review.'

† Hunter on the 'Venereal Disease.'

remained for years in a stable. It is very well known, that horses are affected with hydrophobia when bitten by a mad dog. It is reasonable, therefore, to suppose that, if glanders were equally contagious, the disease would be equally reciprocal. It is a fact well known, that the cow-pox is transferred to the milkers from having wounds or excoriations on their hands ; and *I have frequently had my hands scratched by the diseased bones in dissecting the heads of glandered horses, and covered with matter, but never found the least inflammation excited, or any other ill effects produced ; and I have often applied it to dogs with the same result.*” Mr. Smith argues “the improbability of one horse infecting another,” from the hair with which the animal is “completely covered ;” it being known that rabid saliva is wiped off the teeth by a woollen garment so as to prevent infection, and, moreover, that the matter of glanders becomes soon dry and as hard as glue. “And if there is so little probability of *this poison* being conveyed into the system in the most fluid state, how can it be communicated to it after having remained on the surface of a rack, in the crevice of a manger, or in a hole in the wall, for months or years, as is commonly reported ? This appears equally absurd and incredible as it is for one horse to communicate the disease to another when fifteen or twenty miles apart.”—“But, it may be objected, that, although the mucus has become dry and solid, may not the breath and saliva of the animal render it again fluid, that it may be taken up by the absorbents ?” But, if this were the case, “*the lips, and not the nostrils, would always be the first part affected,*”—“which very rarely happens.” And although the nasal membrane is so much exposed, yet has it “*greater power of resisting the action of any morbid poison,*” from its being “*a secreting surface ;*” “therefore the ulceration observed in the membrane in this disease *does not appear to be produced by the absorption of a poison.*”—“I have in a variety of instances seen one horse lick the nostrils of another that was glandered clean with his tongue, but never saw ulcers produced by it, either on the lips or the tongue.”—“I have known horses of a brigade of cavalry *perfectly free from the disease for a long time prior to their taking the field, yet before they had been encamped two months some of them became glan-*

dered, although they stood on ground where no horses had been for many months, perhaps years, before." "From whence did the disease proceed? Was it contagion? 'Most certainly,' say its advocates." "When at Longford, I was informed by General ——— of some French authors' having asserted that, when the Duke of Marlborough took Lisle from the French, the glanders broke out there among the horses with such virulence that the stables were obliged to be shut up; that they remained so for thirty years; but, from the circumstance of another war, they were again opened, and then, from the infection having—as they affirm—remained in the stables all that time, the horses that were put into them became immediately glandered." Mr. Smith laughs at the idea of ascribing this to contagion—the matter of which, "had it been *brass* instead of mucus or pus, must have been reduced to ashes long before the expiration of this period"—but assigns the true cause to be "*the want of the vivifying principle*"—oxygen; whence alone, in his opinion, "sprung all the diseases which those writers asserted to be the effect of contagion." "When the regiment—the Second Dragoon Guards—returned from the Continent in 1795, in consequence of contrary winds, the horses were kept on board ship upwards of seven weeks, during which time many of them became glandered, and others died without any symptom of this disease. Now, as one of the ships in which the disease prevailed had never been in the transport service before, and consequently these were the first horses that had ever been in her hold, whence did the disease proceed? Could it have arisen from the bottom of the North Sea? in the month of December?"—"It was the depth of the hold in some of them, the obstruction of the air by the forage, &c., the removing of the wind-sails, and the covering up of the hatchways, that indubitably rendered the ships so extremely injurious and fatal to the horses, and produced effects similar, in some degree, to those too frequently experienced in mines and other subterraneous situations." Another striking illustration is afforded by the following narrative:

"A stable at Longford, containing forty-two troop horses, was so constructed that the air could find ingress only by the doors and windows at the two ends. "This did not, however, admit a sufficiency to support such a

number of horses in health; both glanders and farcy consequently prevailed amongst them. That the disease was positively occasioned by *the absence of pure air*, the following circumstance will fully prove:—The first troop of the regiment that occupied this stable entered on the 19th March, 1804, and continued in it until the 23d July, during which period some of its best horses became glandered; but no sooner had this troop left the stable than the disease disappeared from among them; but still continued its ravages in the troop that succeeded it until the 18th January, 1805, when the glass windows fixed above the doors were taken down, and lower ones put up in their stead; and four large tubes, two on each side, were at the same time introduced into the wall, which tubes ascended obliquely through the roofs of the shed-stables. Six points of communication with the atmosphere being thus opened, the cause of the disease was removed; and though the same troop continued to occupy the stable until the 29th of July following, its baneful influence never reappeared.”

“The foregoing statement,” concludes Mr. Smith, “requires no comment.” “The disease, not accompanying the first troop when it left the stable, and its progress, being arrested in the second troop, by removing, through the means of ventilation, the cause which produced it, added to the circumstance of its never appearing again during the time the troop continued there, are facts which every one will be able fully to appreciate.”*

RODET, 1830, Professor at the Royal Veterinary School at Toulouse, and formerly Veterinarian in Chief to the Hussars of the Royal Guard, in reference to the regiments of which he has had the veterinary superintendence, alleges the general predisposing causes of glanders to be, the fatigue, the privations, the excesses, the sudden and frequent changes experienced by military horses in campaigns.” “In regard to remount (young) horses, the principal predisposing causes are, a strong predisposition to diseases of the lymphatic system, having its source or origin in a temperament eminently lymphatic, as is observable in horses with short heads, slender necks, flat sides, narrow chests, and contracted shoulders;”—“castration practised without proper precautions, at a time of difficult dentition, or while they are spreading in growth; lastly, and especially, at the period they are experiencing sudden changes of living, in food and grooming, country, regimen,” &c. “Last of all,

* ‘The Horse-Owner’s Guide,’ 1818.

forage of bad quality.” “Contagion can but rarely be regarded as the cause of glanders in the army, since every precaution is taken to guard against it. It cannot be considered either as a proximate, or as the most frequent or the most ordinary cause, as persons without any knowledge of such matters are apt to believe.”*

YOUATT, 1832 :—“The main cause,”—“the grand cause of glanders is CONTAGION.”—“I advisedly call it ‘the grand cause,’ for I believe I shall be able to render it probable that glanders arises oftener from contagion than from any other source.”†

VINES, 1833, in section 3 of chapter V of his work,‡ treating of “The Infectious or Contagious Nature of Glanders and Farcy,” remarks, in a note explanatory of the meaning and application of the words *infection* and *contagion*, “As we have never seen a case, and are unacquainted with an instance where glanders or farcy was produced by inhaling the breath or effluvia of the body of another animal, *but only by actual contact of matter*, we shall, like Smith and Dupuy, use the terms synonymously.” (p. 157.)—“Mr. Coleman,” says Mr. Vines, “attributes the infection or contagion to a *specific poison in the blood*; and he also asserts that a similar poison exists in those animals where glanders or farcy is generated; that it is formed in the atmosphere of stables by the secretions and excretions of the animal, and that it is *a compo of dung, urine, breath, and perspiration*. But, in my opinion, any impure air which may be thus formed, *only tends to render the system debilitated and unhealthy*; and that from this cause, as well as from a variety of others, *the blood and fluids which are formed are rendered vitiated or unnatural, and of an infectious or contagious character*, and capable of producing general derangement or disease, if introduced into the system of some other animals, especially the ass, *which is almost naturally predisposed to the disease from bad feeding, and the weak texture of its skin*. Thus far only, then, do I consider the discharge in glanders

* ‘Recherches sur la Nature et les Causes de la Morve,’ 1830.

† Mr. Youatt’s Veterinary Lectures, in ‘The Veterinarian’ for 1832.

‡ ‘A Practical Treatise on the most important Diseases incidenta to Horses, more particularly Glanders and Farcy,’ 1833.

and farcy infectious, and *not in consequence of an independent poison in the blood.*" (p. 157, 158.)—"If it is contended that, by inoculating with the matter of glanders and farcy, the proper symptoms are produced, and that the fact is then proved, and that a specific poison thus existed, and that *this poison*, like other poisons, is governed by laws peculiar to itself, and that this is still further proved by introducing blood from a glandered horse into the veins of a healthy ass, and similar symptoms produced, I am prepared to prove *that UNHEALTHY BLOOD taken from an animal NOT GLANDERED will produce similar effects as blood taken from a glandered horse.* In the course of my experiments I *have produced glanders and farcy with a considerable tuberculous disease of the lungs, and water in the chest, that ended in death, in the course of ten days, by introducing half a pint of blood, taken from a rabid dog, into the jugular vein of a five-year-old healthy ass*; and similar effects will likewise follow the introduction of any irritating fluid into the circulation—as a solution of copper." (p. 160.) This clearly shows that it is the particular irritation to which the system of some animal is so susceptible (no matter from what cause) that produces the diseased symptoms, and that it is not the effect of a *specific* or particular *poison* contained in the blood." (p. 161.) Mr. Vines adds, he has seen "glanders, and even death, produced by inoculating an ass with matter taken from an *unhealthy* animal labouring under virulent grease." (p. 161.) "Many of our present practitioners believe that glanders cannot be communicated from one animal to another through the medium of the breath or exhalations of the body, but that it requires the actual contact of glandered or farcied matter to produce an effect. In these views, then, I perfectly coincide, *never having seen a single case which could be fairly attributed to infection, through any inhalation from another horse.*" (p. 166.)—"I find that the contagiousness, by which I mean *the actual contact of matter*, both of glanders and farcy, admits of various modifications: for instance, *in those animals where the system is in the most UNHEALTHY STATE the discharges of matter will be of the most contagious character, and so on the reverse.*" (p. 166.) "Strong, healthy, well-fed horses, are by far the least susceptible of inoculation by morbid matter; while, on

the contrary, those animals which are but badly fed, and out of condition, especially asses—whose systems are always weak—are the most susceptible and liable to become affected, and generally die about eight or ten days after inoculation.” (p. 166.) Mr. Monk, a well-known horse slaughterer in Whitechapel, informed Mr. Vines, “that for sixteen years he has kept a horse in a stable generally containing a number of glandered and farcied horses, but this horse has never been affected.” (p. 168.)

DELWART, 1837, vétérinaire de première classe, Professor at the Veterinary School at Cureghem-lez-Bruxelles, and formerly of the Royal Veterinary School at Alfort, after making mention of other causes, says, “But so many facts militate in favour of contagion, that it is impossible to call it into question. So long as observation and experience are wanting to convince us to the contrary, we shall continue to regard glanders as capable of transmission from one individual to another; and we shall recommend our *élèves*, and all persons charged with the care of animals, to separate with scrupulous precaution any such as may show the slightest signs of glanders.”*

HURTREL D'ARBOVAL, 1838: “The majority of the French veterinarians of the present day, if they do not entirely deny the contagiousness of glanders, have come to think that it is a more rare occurrence, and one attended with more difficulty than it was formerly. Many have come to the conclusion that glanders is contagious only in the acute form, and this, at the time we are writing, is the opinion most commonly entertained.” . . . “For our own part, however,” says D'Arboval, in winding up this paragraph on contagion, “we can conceive a disease to be more contagious at one period than another, but not in any distinct form. Either a disease must be contagious in all its forms or varieties, or in none of them; or the so-called forms are no longer the same disease.”†

LEBLANC, 1839, a veterinarian of repute in France, and in England too, from his literary works, comes to the conclusion,

* ‘Pathologie Spéciale, ou Description des Principaux Animaux Domestiques.’

† ‘Dictionnaire de Médecine, de Chirurgie, et de Hygiène Vétérinaires, 1838.

after an examination into the different kinds of glanders and farcy, that “*in all their forms they are contagious, though in different degrees.*”*

BLAINE, 1841 : “ Both glanders and farcy originate in contagion ; and *infection*, in its strict sense, is the cause of acute glanders at least.”†

THE EXCITING CAUSES of glanders, many and various though they be, admit of distribution into five classes :

THE FIRST CLASS comprises such as come under the head of *contagion*.

THE SECOND CLASS includes those causes that come under the denomination of *infection* : the principal—perhaps the only one—being the *miasm of the stable*.

THE THIRD CLASS comprehends all such causes of a common kind as, acting on the animal’s constitution in an ordinary or healthy condition, produce ordinary effects, but which *operating against morbid or vitiated states of body*, produce malignant disease, such as glanders, farcy, &c.

THE FOURTH CLASS is devoted to the consideration of causes, still of an ordinary nature, but which, in consequence of their operation being *intensely severe or subitaneous*, have been said to be followed by glanders and farcy.

THE FIFTH CLASS embraces those diseases—of *the air-passages and lungs* especially—of which glanders and farcy are known under certain states and circumstances to be the occasional sequel.

CONTAGION.

I have placed *contagion* in the first or highest class of causes, not because I regard it either as the most frequent or the most important of causations ; but because I think the early consideration of it may cast a light on some of the other causes to be afterwards inquired into, in particular on those included under the head of the *miasm of the stable*.

BETWEEN INFECTION AND CONTAGION, according to the late

* ‘Des diverses Espèces de Morve et de Farcin,’ 1839.

† ‘Outlines of the Veterinary Art,’ fifth edition, 1841.

Dr. Hooper,* “there does not appear to be any distinction made;” according to Dr. Copland,† such distinctions as have been made are without “a true difference.” We learn from the latter eminent authority, that M. Dupuytren regarded *infection* as “the contamination of the air by persons confined in low, close, ill-ventilated, and dirty situations, and by vegetable and animal substances undergoing decomposition, the emanations with which the air is thereby charged acting on man as poisonous agents.”—“*Contagion*, on the other hand, Dupuytren considers to be in many respects independent of atmospherical conditions, and a species of germ or virus developed in the bodies of the sick, or forming an atmosphere around them containing the principle of the malady; and through the medium of this germ, virus, or morbid principle, the malady is transmitted to the healthy.”—Dr. Copland himself uses the word *infection* “in its generic acceptation:”—“applying it to whatever may affect, so as ultimately to *taint, pollute, or corrupt the body.*” And the word *contagion*, as a form or kind of infection—“as an *infection by immediate or mediate contact*—as a *pollution by the touch.*” With a desire to conform in the use of these terms, as nearly as we can, to this lucid exposition of their true or natural signification, we shall use the word *contagion* to express the transfer of glanders or farcy, through whatever means, from one horse to another; and the word *infection*, for such taint or pollution *from other causes* as still may produce the disease, the same as though it had originated from inoculation or contagion.

THE CONTAGIOUSNESS OF GLANDERS has proved a fruitful theme of disputation among veterinary writers; some contending that a glandered horse carried a poisoned atmosphere about with him wherever he went, contaminating all other horses within a certain distance of him; others as confidently assuring us that we had nothing to fear unless by actual contact, and not very much even then. All the old writers, some of the modern, are in favour of contagion: “it infects the very air,” says Solleysell; “it is caused by contagion alone,” says Volpi; and White, of our own country, confirming

* In his ‘Medical Dictionary,’ article “Contagion.”

† In his ‘Dictionary of Practical Medicine,’ article “Infection.”

what Volpi has asserted, concludes by saying he has "long held the same opinion." The first to question this doctrine was Lafosse: out of seven species or varieties of glanders he described, but *one* he said was contagious, and that *rarely propagated its contagion*. After the Lafosses' (father and son's) days, the doctrine of *non-contagiousness*, or rather that of *comparatively little contagiousness*, gained so much ascendancy, that there were those who hardly scrupled to affirm, the disease could not be caught in any such manner: Dupuy "knew of no well-conducted experiments in favour of contagion:" Coleman did not believe that one horse in a thousand, or even ten thousand! received the disease through contagion;" and Smith "has never seen one case of glanders that could be traced to infection." Most recent veterinary writers have been content to assert the contagiousness of glanders without qualifying their assertions with any such remarks as, the disease is never, or hardly ever, taken in that way, or never, or hardly ever, taken in any other way. I do not think that any veterinary surgeon of the present day absolutely *denies* the contagiousness of glanders: nevertheless, since, for my own part, I feel no hesitation in pronouncing it to be *a contagious disease*, I think it my duty in this place to give my reasons for holding such an opinion.

The admitted most direct proofs of a disease being contagious are,

First, its propagation by inoculation.

Secondly, its spreading from the diseased to the healthy, *immediately*.

Thirdly, its transmission through the medium of habitation, clothing, &c., or through the breath or air.

THE PROPAGATION OF GLANDERS BY INOCULATION is a fact so well established that it appears supererogatory to offer any examples of it. It was one of the first questions regarding glanders and farcy which the late Professor of the Veterinary College sought to set at rest; and it was, in numberless instances, proved in the affirmative, both by himself and those studying under him, in the most complete and satisfactory manner.

In later times inoculation has been practised more by way

of a test of the presence or genuineness of glanders in doubtful cases than with any view of proving its communicableness ; and asses, on account of their comparatively little cost, have commonly been chosen as the subjects of inoculation : the circumstance also of their being, as I before observed, more predisposed than horses to take glanders and farcy, has rendered them additionally inviting. It is not often we hear of inoculation being practised in the horse. I performed it once myself on a healthy middle-aged horse : whether the result proved glanders or not my reader shall determine.

On the 11th of September, 1818, I inoculated a brown horse, then about seven years of age, upon the septum nasi, with matter of glanders procured from the slaughterer's at Cow Cross. On the third day there was a pimply and slightly tumid condition of the part of the membrane inoculated, accompanied by some trifling yellow albuminous issue from the nostril, and swelling of the submaxillary lymphatic gland of the same side ; and on the fourth day there was evident ulceration, with augmented discharge, and that of a purulent character. On the fifth day there were to be plainly seen two large, unhealthy-looking ulcers upon the inferior part of the septum nasi, and there was a mixture of pus and mucus ejected from, as well as adhering about, the external nostril ; and from the enlarged submaxillary glands was proceeding along the hollow between the jaw-bones a cord of tumefied absorbents of the size of my wrist. On the eighth day the ulceration had become deep and extensive. On the eleventh, another cord of absorbents proceeded from the swollen submaxillary glands, over the side of the face, to the affected nostril ; and next day suppuration had taken place in a couple of buds upon the cords of absorbents. On the fourth day after inoculation, barytes, in its pure or caustic form, was administered, a medicine in which, at that time, my father and myself placed great faith as a remedy for glanders ; and the same medicine was prescribed throughout the case. From the twelfth to the twenty-ninth day no material change was noted ; but, on the thirtieth day, such were the alterations for the better that hopes, which had almost been abandoned, suddenly and unexpectedly were revived, and there seemed every prospect of recovery. The

ulcerations upon the septum were manifestly healing, all swelling had left the nostril, and the enlarged glands were diminishing. On the thirty-seventh day there remained but the cicatrices of the ulcers to be seen, with some slight mucous discharge. The appearances of farcy were vanishing also; the farcy-buds, or rather ulcers, healing and cicatrizing; but the enlarged gland under the throat felt soft and disposed to suppurate and ripen. By the fiftieth day, however, all signs of disease had disappeared save some trifling remains of induration underneath the jaw.

If this was not a case of glanders and farcy, it was, at all events, a case that nobody, save through the test of inoculation, could, for the most part of its progress, have distinguished from glanders and farcy; and that it was not I can imagine many veterinarians will contend, and for two reasons;—one being, that the enlarged submaxillary gland showed a tendency to suppurate, though, after all, it did not break; the other, that the case ended in recovery. It must be remembered, however, that other instances of alleged “cure” stand on well-authenticated record; and that, therefore, this might have been a case, like many or most of *them*, of spontaneous recovery, and consequently there was no absolute need of ascribing the horse’s getting well to the barytes.

May 24th, 1820, I inoculated an ass about ten or twelve months old with matter taken from a horse of Mr. Stowe’s, a farmer, at Farnborough, suspected to have (chronic) glanders. No effect followed. On the 28th I repeated the inoculation with matter taken from the frontal sinus of Lieut. Rich’s horse, also suspected of having (chronic) glanders. June 6th, still no appearance of disease. I next procured some matter from an acutely glandered subject, standing for slaughter at Cow Cross, and with it repeated the inoculation for the third time, as before, scarifying the *ala nasi*, and rubbing the virus upon it. On the fourth day after the last inoculation, this nostril had become swollen and tender, and had a knotty feel, evidently from lymphatic inflammation; the submaxillary gland of the same side was also swollen and tender on pressure. *On the sixth day* a foul ulcer appeared upon the inoculated part. *On the eighth* there came discharge from both nostrils; and the ass had fallen very lame in the near fore leg, seemingly from an attack (as yet concealed) of farcy. *Ninth day*, the animal commenced heaving at the flanks, and appeared altogether very ill, continually lying down, &c. Three pints of blood were drawn; this, however, was no sooner done than he became faint from its loss, and staggered, and died about five minutes afterwards. Examination of the head

showed the Schneiderian membrane, on both sides, reddened and thickened in substance, its surface studded with small white tubercles, which, in a short time, would have turned to ulcerations; likewise the nasal *meatus* was filled with sero-mucous discharges.

No question, I should imagine, can arise, that, in the case of the ass just related, glanders and farcy also were produced by inoculation. The same fact stands likewise proved in the case extracted from the late Mr. Field's 'Record.'* Again, we may adduce, as confirmatory evidence—if any be wanting—

THE COMPTE-RENDU OF THE VETERINARY SCHOOL AT ALFORT for 1839-40. MM. Renault and Bouley have prosecuted their researches into the nature and symptoms of glanders, with especial direction of them to its *contagious* property, to which increasing interest has been given since the disease—in so many instances—has proved communicable to the human subject; and they have arrived at the conclusion that *acute glanders is contagious by inoculation from horse to horse*. In the animals they have inoculated, *without a single exception*, the infection of glanders has made its appearance from the third to the fifth day.

Standing, however, as the fact of propagation through inoculation does upon the ground of undeniable proof, yet it is also a fact with which those in the habit of practising inoculation are likewise well acquainted, that it is by no means certain that the disease follows the application of the virus: a good deal of fastidiousness or predilection is often manifested on the part of the inoculated subject which we are unable to account for; and this has led some into the error that glanders was not at all or hardly producible in any such manner, and others into the belief that the chances of production were so small as scarcely to render such a result probable. It is evident the success of inoculation must depend upon two conditions:—the condition of the animal from which the matter is taken to communicate the disease, and the condition of the one to whom the matter is applied to receive it; and that, supposing either of these conditions fails, no result can follow. In the case of the ass but just given, it would appear that the horses from which the matter used in the first two inoculations was

* To be found at p. 183.

obtained, were, if glandered at all, but *chronically* so ; whereas the matter that had the desired effect was procured from a condemned subject in the last or ripest stage of *acute* glanders. In order to ensure inoculation for smallpox or for vaccination, we know surgeons to be very particular about the day on which they collect their lymph, believing, nay, knowing, it to be more efficacious or “stronger” at one period than at another, and to grow less efficacious or “weaker” as the disease declines. Why should not something of the same kind happen in the progress of glanders or farcy ? It is, indeed, asserted, and on good authority, that in the acute forms or stages these diseases are more contagious than in the chronic or latent forms or stages ; a fact which seems to harmonise with the result of our experiment upon the ass, as well as with what we have just observed in regard to the smallpox and cow-pox ; those diseases being found to be most contagious when at the height of their natural course.

But inoculated glanders differs strangely from inoculated diseases in general—from inoculated smallpox and cow-pox, for example. These disorders are rendered mild and comparatively harmless by being produced in such manner,* whereas glanders, the product of inoculation, commonly manifests itself with augmented virulence and malignity. A horse taking glanders in the common way, apparently spontaneously, may, and often does, have the disease in a subacute or comparatively mild form ; whereas, when we inoculate an ass for the disease, we expect no other result than, should the inoculation take effect, to see it fall a prey to the ravages of glanders and farcy in the very short space of time of ten or twelve days ! Aware of this, we are furnished at once with a reply to persons who inquire of us, why we do not inoculate horses for glanders

* The effect of inoculation is to lessen the number of pustules (in smallpox) ; and thus to diminish the general violence of the disease. The mortality from natural smallpox used to be as much as one in six ; whereas, after inoculation, not above one in two—say in five—hundred, dies. Dr. Fordyce said that the severity of the inoculated disease was regulated by the quantity of matter used in inoculation ; it is, therefore, right for us to use as little as possible in smallpox, but in cow-pox a considerable quantity should be introduced. (Dr. Elliotson’s ‘Lectures.’)

or farcy, the same as surgeons do children for smallpox and cow-pox. But, supposing even that the disease were, by inoculation, rendered comparatively mild, and in that mild form were curable, still are we certain that once having it would prove any immunity against taking it afterwards? The fact of the disease appearing in an aggravated rather than a mitigated form after inoculation, also in some measure accounts for the rapid and fatal course of it in those melancholy cases in which man has been the subject of it. I do not know that in any instance man has taken the disease save from inoculation: a fact somewhat singular, and one that possibly may prove of some service to us hereafter.

It is not reasoning on sound pathological principles to argue that a disease is not contagious, simply from the circumstance of matter supposed, or even proved, to contain its virus having been besmeared upon the Schneiderian membrane, or having been swallowed into the stomach, without being followed by contamination. I have myself, on several occasions, rubbed upon this membrane what I imagined to be glanderous matter with impunity. On the other hand, I have produced the disease in this manner. In an experiment apparently so simple as this appears, there are still several conditions on which its success must depend. There is, as was before observed, *the condition of the matter*, dependent on the kind, the stage, the duration of the disease affecting the subject from which it was taken; next, there is *the condition of the subject* to which it is applied to receive the disease;* and, lastly, there is to be taken into the account *the condition of the Schneiderian membrane*, ordinarily shielded as it is by its natural mucous secretion from harm, and resistant as it is by nature to the action of *virus* or poison of any kind. I have, on many occasions, imbrued my own hands with the matter of glanders, falsely believing my constitution to be insusceptible of taking any harm, and therefore unheeding whether there were scratches

* I quite agree in opinion with Mr. Vines, that "strong, healthy, well-bred horses are by far the least susceptible;"—"while, on the contrary, those animals which are badly fed and out of condition, especially asses, whose systems are always weak, are the most susceptible." ('Practical Treatise on the Diseases of the Horse.')

or wounds upon my hands or not : although however I escaped, and hundreds of others escaped infection, yet, at length, did one and then another person catch the disease ; and now veterinarians no longer dare do that which they have a hundred times before fearlessly done, and with impunity.*

With regard to the fact of the matter of glanders having been made up into balls, and so introduced into the stomachs of a horse or ass without producing the disease, a fact to which much importance has been attached by some of our non-contagionists, it is no more than in accordance with experiments of the same kind that have been made with other poisons. Speedily and deadly fatal as the Woorara poison is known to be, inserted in the form of inoculation, Sir Benjamin Brodie found he could administer it by the mouth, even in considerable quantities, without producing any perceptible effect whatever.

THE SPREAD OF GLANDERS FROM CONTAMINATED TO HEALTHY HORSES, influenced as it is and naturally must be by a variety of circumstances, can be proved, beyond any reasonable doubt, to have on many occasions taken place.

PROFESSOR COLEMAN—non-contagionist as he was in his opinions—was wont to relate in his lectures a “*remarkable instance*,” as he called it, of glanders being communicated from one horse to another. The Professor was sent for into a gentleman’s stable to examine one of his carriage-horses that had been some time unwell. He found the patient standing in his stall between two others, and pronounced him glandered, and had him shot. One of his other horses also had a discharge from *the nostril that was nearest* to the glandered horse. Him he had removed. To no purpose, however ; for he turned glandered, and was likewise shot. Not a great while afterwards, the third horse took to discharging from the *opposite nostril*—still the next one to the horse that stood in the middle stall—and he also in the end proved glandered.

MR. SELBY, OF WILMINGTON, in the month of July 1826, sent to my father at Woolwich two cart-horses—a black mare, ten years old, and a grey mare, about sixteen or seventeen years old—which he had purchased in the autumn

* We have endeavoured, by a succession of inoculations, to determine whether acute glanders loses its contagious property by reproduction ; and we have seen that, *even in the seventh generation*, the virulence was as active in its effects as when it proceeded from glanders spontaneously developed. (‘Compte Rendu of the Veterinary School at Alfort, for 1841-2.’)

of the preceding year, and had worked ever since. The black mare, however, had had "a cold" on her since Christmas. Three weeks ago, for the first time, tumours were discovered underneath the jaw. The black mare proved confirmedly glandered: she had three or four chancreous ulcers upon the *near* side. And the grey mare, who had only recently shown any, and that but trifling, flux from the nostril, was pronounced as certain to become so—if not glandered already—from the circumstance of her having stood on the *near* side of the glandered horse, without any stall or partition between them. In the end both were destroyed.

THE REVEREND MR. RASHLEIGH, OF SOUTHFLEET, in the year 1821, sent to my father a brown horse, for an opinion concerning the animal. The horse manifested sub-acute glanders. He had come out of a stable inhabited by one that had recently been shot on account of glanders; and two others, living in the same stable, subsequently took the disease.

GENERAL SIR J. M'CLEOD, OF THE ROYAL ARTILLERY, had a horse become glandered in his stable, which was instantly, on its discovery, removed. Five weeks afterwards, a brown stallion that had stood in the next stall to him, who had on no previous occasion shown the slightest ill-health, was removed in consequence of an ulcer having a healthy aspect making its appearance in the *near* nostril. The ulcer healed while in the infirmary, and the horse was thought to be recovering, when, a week afterwards, the patient was suddenly attacked with excessive pain and lameness in one hind leg; so painful was it, he refused even to place it on the ground. Three days after this attack the septum nasi, on the same side as before, manifested foul and spreading ulceration, and farcy declared itself in various parts of the body.

MR. TURNER'S CASE OF "INSIDIOUS GLANDERS," related at page 189, tends to the establishment of the same point—the propagation of glanders from horse to horse. The black hackney mare Mr. Turner had condemned as glandered, and that was doomed to slaughter, was purchased by a farrier for three pounds, who subsequently was said to have "*nearly* cured" her. A month afterwards, Mr. Turner was examining some post horses in the very stable where the "*nearly* cured" mare had been standing, and found two of them glandered and two farcied; and yet this stable, for many a year before, had never harboured a case either of glanders or farcy. This led to another examination of the black hackney mare. She was precisely in the same state in which she was when Mr. T. had pronounced upon her case before. And what rendered the affair so much easier of unravelment was, that the first horse that failed was *her own partner*.

MR. HALES, V.S., OSWESTRY, whose "faith in contagion is not so strong as to believe some of the extraordinary accounts that are given of glanders being caught in this way"—but whose experience has "fully convinced" him "that the disease may be readily communicated by a glandered horse being stabled with others, or kept at grass in the same pasture with them," sent the following plain and convincing statement of facts to THE VETERINARIAN for 1834:—

“In February, 1832, I was sent for to give my opinion on the case of a horse supposed to be glandered. I felt no hesitation about the matter; and, as the horse had been diseased for several months, he was shortly afterwards destroyed. In the latter end of June in the same year, I received a letter from the gentleman, the owner of the above-named horse, again requesting my attendance at his house. I found that my patients were two very fine four-year-old horses that had farcy ulcerations and swellings upon the extremities: the disease had been observed for two or three weeks, and the horses prescribed for by a veterinarian of the neighbourhood. Knowing the previous case of glanders, I very strictly inquired whether there had been any communication between these young horses and the one that had been destroyed, and was positively assured by the proprietor of the horses and his groom that there had been no possibility of intercourse between them; and that they had, in fact, never been near the glandered horse, and that anything like contact or application of matter was out of the question. After this declaration, I was obliged to admit and to consider that the farcy must have had its origin from some other source than contagion, and advised that Mr. Vines’ plan of treatment should be adopted. The gentleman now asked me to walk with him to a field at some little distance from his house, in order to see a very fine hunter that he supposed had taken a cold some time ago, and which had left an enlargement under his jaw, which he should like to have removed; at the same time remarking, that there was not much the matter with him, for he was in as good health and spirits as a horse could be. I found the horse full of flesh and spirits, but with an enlargement of the size of a pigeon’s egg firmly attached to the lower jaw, and a discharge, but not a profuse one, from the nostril of the same side. The horse had been in the same state for three months. The case was now unravelled; for although this horse had not been kept in the same stable with the subject of the first case, still there were frequent opportunities of communication; they were watered often from the same bucket, and the same brushes, &c. made use of in dressing them: in fact, the first case was not supposed to be glandered till shortly before I saw him, and no very strict quarantine had been enforced. In May, the hunter (with the enlarged gland and nasal discharge then upon him) had been turned into the same pasture with the young horses, and they were kept together until the young horses were removed in consequence of their having become diseased. Treatment was of no avail, and in six weeks the young horses were decidedly glandered. A professional friend who saw them agreed with me in opinion that it was putting their owner to useless expense to continue the treatment any longer, and they were destroyed. At this time the constitutional symptoms showed themselves in the hunter; ulceration and bleeding from the nose came on, farcy supervened, and this very valuable horse, for which 150 guineas had been refused, was consigned to destruction. The value of the three horses mentioned was at least £400, and I think there can be no doubt that in them *glanders was propagated by contagion.*”

"How often have I heard it affirmed," says Leblanc,* arguing in favour of contagion, "by the proprietor of horses, that his stud has lived in the same stable, and been fed and groomed and worked alike for years, and never have had any glanders or farcy break out among them until an infected horse entered his establishment."—"Not only," continues Leblanc, "have I heard this a hundred times, but I am myself convinced of the truth of such statements; and I am acquainted with a great number of veterinarians who have been witnesses to parallel occurrences. And this observation applies to glanders in all its stages and varieties" (p. 66). And in another place (p. 68) the same excellent authority follows this strong expression of his own opinions up, by asserting that "at the present day, an immense majority of the veterinarians of Germany, Britain, Belgium, Italy, and Spain, believe in the contagion (even) of *chronic* glanders."

It would be an easy matter for me, or for any person engaged in practice, to multiply examples of presumptive contagion; but if those I have adduced, in combination with the established fact of propagation by inoculation, fail in carrying conviction to the unbiassed mind, that glanders is a contagious disease, I should feel apprehensive that any addition of narratives of similar occurrences would prove alike unsatisfactory. I am aware it is just as easy for anti-contagionists to bring forward an equal or even a greater number of examples of sound horses having stood beside of or lived or associated with others that were glandered without having caught the disease. Such, however, to my mind, estimated *at the most*, but tend to show that the chances against contagion are greater than those in favour of it; and by no means insubstantiate authenticated facts proving glanders to be a contagious disease. Were counter-facts such as these allowed to have more than their due weight, it would be easy to show that the contagion of syphilis were matter of doubt: six healthy men shall have intercourse with the same diseased individual woman, and it shall happen that but one or two of the men shall take the venereal disease, the remaining four or five shall escape. Does this throw any difficulty in the way of believing syphilis to be contagious, when, both by inoculation and contact, it has, over and over again, been demonstrated to be communicable? Supposing for a moment—and I believe such to be the case in glanders—that instances wherein, under the

* Op. cit., at p. 217.

influence of contagion, no disease has been contracted are in amount greater—even much greater—than the examples wherein contamination has taken place, still, if half-a-dozen honest cases of proved contagion can be adduced, they are of themselves sufficient, against all the host of evidence on the other side, to prove the bare fact, that *the disease is a contagious one*. And, after all, the counter-evidence amounts but to this—that so far from being a *highly* contagious disease, the chances of escaping are *greater* than those of catching its contagion.

Mr. Field, senior, Veterinary Surgeon to the 2d Life Guards, had in one of his infirmary boxes at Windsor Cavalry Barracks a troop horse, which he felt but too confident had glanders; and, with a view of testing the contagiousness of the disease, he turned into the box, along with the horse, a healthy ass. The two animals lived together a month—eating out of the same crib, and drinking out of the same pail—without the latter, taking the disorder. So far the experiment was satisfactory. To carry the test further, however, Mr. Field inoculated the ass with matter taken from the nose of the horse. The ass in due time became contaminated with glanders in its virulent form, and in consequence he was, along with the horse, without further doubt or demur put to death.

MR. SMITH has related several similarly striking instances of horses that have stood beside of, or been stabbed with, glandered and fareied subjects, escaping the disease.*

MR. VINES, also, has adduced strong evidence of non-contagiousness in his mention of the strange immunity enjoyed for sixteen years by Mr. Monk's horse in a stable inhabited by condemned subjects.†

Still, I must repeat, these cases,—in most of which the disease, I fancy, will turn out to have been glanders in its *chronic* or least contagious form—after all, when set against those in favour of contagion, but tend to show that the chances of a sound horse taking the disease in such a manner are little compared with his chances of escaping the contagion.

OF THE TRANSMISSION OF THE CONTAGION OF GLANDERS THROUGH THE MEDIUM OF STABLING, I have had happening, in my own regiment, as remarkable and convincing a demonstration as probably stands on record. I entered the 1st Life Guards as veterinary surgeon, in the year 1827. Up to 1833 not a single case of glanders or farey, or of any disease approaching thereto, had come under my notice. March 14th,

* Op. cit., p. 214.

† Op. cit., p. 215.

1833, the regiment, then stationed in the Regent's Park Barracks, was ordered away into cantonments at Barnet, Whetstone, Hornsey, and Highgate, in consequence of an election for members of parliament about to take place in Maryle-Bone, taking with them 272 horses, all supposed and believed to be "effective," *i. e.* in good health. The regiment remained in out-quarters eight days, returning on the 22d of March into the barracks. The day after its return,

THE COLONEL'S CHARGER, a dark chestnut horse, whom I had known for the six years I had been in the regiment as a hardy horse and one that had never ailed anything—was brought to me with a complaint that he had "caught a cold standing at out-quarters." He had not during the last night fed with his usually good appetite, and this morning he evidently looked dull, and his coat was roughened and lustreless; also his hind legs were filled, showing a disposition to be "humoury." His pulse was quicker than natural, and his mouth unusually warm and dry, and there was some little watery issue out of the corners of his eyes and from his nose. I ordered him into a box, to take aperient medicine, and live upon mash diet. This was on the 23d of March. On the 25th the horse appeared better. On the 28th, however, the man still complaining of his being "humoury about his hind legs," more aperient medicine was given.

31st.—Although he has been purging, and the physic is at present but "setting," a corded swelling as large as my wrist has appeared on the inner side of the off thigh, extending from the groin to the hock, which feels hot and gives pain on pressure. Let him be largely bled immediately, and have a dose of calomel and aloes, with common turpentine; and be exercised twice a day.

April 1st.—The swelling in the thigh has disappeared, owing to the large and timely bloodletting.

Some return of it took place on the 7th, and in consequence he was bled again.

14th.—Some swelling has again appeared. Bleed again, and continue the calomel and aloes and turpentine, in divided doses.

On the 4th of May, a chain of superficial ulceration broke out between the hock and fetlock, discharging foul ichorous matter. Is now taking iodine: the general health being tolerably good, and the appetite quite restored.

Up to the end of June, the iodine treatment was pursued, but with no permanent benefit, though at times it was thought to do good. The limb became ultimately very large, and the sheath partook of the tumefaction; and in this state of incurability the horse was, in accordance with the regulations of the service, destroyed.

THE COLONEL'S LITTLE CHESTNUT HACKNEY—rather a

tender-constitutioned animal—was brought to me the next day after his charger was taken unwell, also on account of a “cold.” The symptoms, with the exception of the swellings in the hind limbs, were about the same as in the charger: I had him bled, and gave him an aperient, and ordered low diet.

April 1st.—The off hind fetlock has taken to swell.

3d.—The tumour has broken on the inner side of the joint, as though a small abscess had formed there; but there are no cords, nor any swelling whatever to be detected in the thigh.

6th.—A yellow-greenish muco-purulent discharge from the off nostril.

7th.—The submaxillary glands tumefied, and the cord of tumid absorbents, altogether as large as my wrist, proceeding from the swollen glands along the hollow of the jaw to the symphysis.

10th.—Two circular ulcers with elevated margins and surfaces covered with incrustations appeared upon the septum nasi.

12th.—Ulcers spreading—the discharge, still muco-purulent, has lost its greenish tinge.

15th.—One ulcer is half an inch in breadth.

16th.—Now so decidedly glandered, and farcied as well, that I have recommended he be shot.

March 23d, 1833, the same day the colonel's charger fell sick,

A 24, BLACK TROOP-HORSE was brought to me for being “off his feed.” He was in good—fat—condition; but was not looking healthy in his coat. I ordered him a soft diet, and gave him some opening medicine; after which he appeared to amend.

On the 1st of April, however, he was again brought to me for a “blotch” on the outer side of one of his arms, which was surrounded by a circumscribed swelling. At first it appeared to me like the effect of a blow; and I accordingly ordered fomentation and physie.

The physie worked briskly; the swelling subsided; and the appetite became restored: but a sore remained, half as large as a sixpence and of a circular figure, with a yellow base.

April 7th.—Another blotch has appeared at the place where he was bled from the plat vein. I begin to suspect farcy. His coat lacks brightness, and his pulse is increased.

10th.—My suspicions have become confirmed. Cords of absorbents are now running from the last ulcer upwards to the eariform process of the sternum, altogether about a foot in length.

16th.—What has been done—Bloodletting and purgation and diuretic medicine have made no alteration in the tumefied absorbents. His general health is not so good as it was.

30th.—Since the date of the last report, strong mercurial ointment has been rubbed into the corded absorbents, and calomel given; but with no good result.

May 2d.—His appetite fails him; pulse 60, and stronger and fuller than it has been. Keeps up his flesh pretty well; though his coat seems permanently to have lost its gloss and does not shed kindly, as it ought now to do.

10th.—The tumefied lymphatics have increased in size and are distinctly knotted; but as yet no abscess has broken. But the submaxillary glands of the right side have suddenly swollen to the size of an egg: though the swelling has a lobulous loose feel, and gives pain when squeezed.

11th.—The man says he has seen some efflux of “watery humour” from the off nostril, though I can see none myself. The Schneiderian membrane, on both sides, certainly appears higher coloured than natural. Discontinue the mercury, and let him take iodine.

12th.—The nasal flux is apparent: it is muco-gelatinous.

13th.—An ulcer, indisputably glanderous in its character, is now visible upon the septum nasi, high up; the membrane around having a carnation hue.

18th.—The ulcer has extended considerably, and grown pale. The flux is sero-purulent. His old coat clings to him. Let him take iodine.

25th.—A farcy pustule has broken in his breast—the hind legs are both filled—one of the fore limbs is likewise swollen. Continue the iodine.

27th.—Fresh ulceration observable upon the Schneiderian membrane, and the hind legs are more swollen.

June 4th.—Since the last report the disease has been making progress in all the affected parts, and several other tumefactions, about the magnitude of eggs, have appeared in different parts of the body, neck, and arms. Continue medicine.

18th.—Has been progressively in every way growing worse, and now is in that hopeless state of glanders and farcy that his destruction becomes imperative.

C 21, BLACK TROOP-HORSE, making the fourth case, did not fall ill until the 5th July—fifteen weeks after the return of the regiment into barracks. His first symptoms were discharge from one nostril of a suspicious character, and submaxillary tumefaction, and these speedily resolved themselves into acute glanders; for which, at the urgent request of the commanding officer, he was shot so early as the sixth day after his attack.

FURTHER PARTICULARS, throwing light on the origin of the above cases, stand as follow: The colonel took out of barracks but the two horses in question, and they stood by themselves in a four-stalled stable at the head inn at Barnet, and while there appeared all along to enjoy good health. A 24, stood

with one other troop-horse in a small stable at Whetstone, much out of repair, and in a filthy condition, from holes and defects in the (cobble) paved flooring. C 21, troop-horse, stood with some others—I have forgotten their number—in a stable also of an inferior description, at Barnet. It is well known to people in the army, that the proprietors of inns and posting or coaching establishments, make it a rule to send military horses billeted on their houses into their worst stables, nor would some of our worthy hosts, I am afraid, be over-scrupulous about such stables being wholesome or free from infection. In addition to which it may be stated, on almost public authority, that Barnet and Whetstone, having been for years towns wherein large numbers of coach and post horses have been kept for work on the great northern roads, many of whom from time to time have turned glandered and farcied, are both places that may be said to harbour the *fomes* of contagion.

CONNECTING, THEN, ALL THESE CORRELATIVE FACTS—the non-appearance of either glanders or farcy in the regiment from 1827 to 1833; its quick and sudden eruption on the return of the regiment from out-quarters in three instances, and fifteen weeks afterwards in a fourth, notwithstanding every horse left the Regent's Barracks apparently in full health only the week before; its disappearance with that fourth case, and no return in any shape whatever of the disease since 1833, up to the time I am writing, the conclusion of 1844; the airy cold stables, from want of repair, in which the horses were lodged at Barnet and Whetstone, together with the proverbial *fomites* of those two towns for glanders and farcy;—I say, taking all these circumstances into account, I do not see to what other conclusion we can reasonably come than that the disease was the product of a contagion, to the influence of which the horses were exposed during their sojourn at out-quarters. Educated as I have been in the Coleman school, imbibing as I there did notions of non-contagion, I must confess I was in the early part of my life sceptical concerning the contagiousness of glanders; not doubting its *possibility*, but questioning its *probability*; the above series of incidents, however, occurring as they did under my very nose, have dispelled

any scruples I may have had left on the latter point, and in my mind established the fact, together with its likelihood in certain situations and under certain favouring conditions, to become realized, beyond the reach of being shaken by any arguments founded upon the present state of our knowledge of the etiology of glanders. It is very natural to ask,

HOW HAPPENED IT THAT 268 HORSES ESCAPED? even those in the same stables with and standing by the very sides of them that contracted the disease? Every circumstance of regimen and work, as well as habitation, probably, with the bulk of them, being similar, we have no means of accounting for this dissimilarity of result, save in the resort we have in the medical axiom of *insusceptibility*; but in what that consists—why one horse should prove susceptible, another not—we know no more than we do about the *modus operandi* of contagion itself. Had the disorder been catarrh, or simple fever, the probability is, among such a number of horses there would have been more cases of it: the sequel proved that it was neither—that it was, in fact, no other disease from its very beginning than glanders and farcy.

COLEMAN, probably, would have ascribed the production of the disease to the *foulness or want of ventilation* in the stables the horses inhabited. The colonel's two horses, however, had a four-stalled stable to themselves, and consequently could hardly be said to be in *confined* air; and the stables the troop horses occupied were, for the most part, in such want of repair that air-holes were more numerous than were desired; and though the floorings were in a dirty or filthy condition at the time the troops first took possession, yet would military discipline not allow them to remain so. Considering, therefore, these circumstances, and taking into account the number of other instances that might be—and some of which in these pages have been—adduced of the influence of contagion, for my own part I think we have good reason for alleging the same to have been the exciting agent on the occasion in question. Presuming, then—and we think we have shown strong reasons for so doing—that

STABLING MAY BE THE MEDIUM OF CONTAGION, the inquiry comes before us—and an interesting one it is—whereabouts

and in what form the contagion presents itself, and what is required to render it operative. Applying our observations especially to the case of the introduction of glanders into my own regiment, there appeared but two ways in which consistent virus or emanations from it could have reached the nostrils of these horses; either through some part of the stable, the mangers in particular, or through the water pails, neither halters nor bridles of any kind having been used save what the men took out of barracks with them. And as it is probable the pails had, up to the time the men marched into their quarters, been in constant use at the inns—there rarely being in such establishments any utensils of the kind to spare—it seems but reasonable to infer that the wooden stable fitments, the racks and mangers more particularly, were the contaminating media. Admitting that they were, there arises another question: viz., in what manner was the transmission made? Shall we say that glandered horses had inhabited the stables, and besmeared with their discharges the mangers, &c., leaving upon their surfaces desiccated matter which waited but for moisture, and especially for moisture with heat, to render it active and operative again? And shall we suppose that the sound horse, who took the contagion, in some way or another actually got this moistened matter conveyed upon the membrane lining his nose, and so inoculated himself; or that he inhaled the effluvia caused by moisture and heat to arise from the desiccated besmearments, and that these effluvia entering with the air into the animal's air-passages, therein became absorbed, and thus infected his system: the contamination, therefore—*mediate* instead of *immediate*—breaking out afterwards in the form of glanders and farcy? I must confess I think this latter the more feasible *modus operandi* of the contagious virus; and my reasons for so thinking are—first, the unlikelihood of any of the dried matter obtaining admission in any consistent form into the nose; secondly, the results' being so different; in one horse the contagion producing farcy; in two others, farcy succeeded by farcy-glanders; in the fourth case glanders alone.

THAT THE CONTAGIOUS VIRUS ENTERS THE HORSE'S SYSTEM THROUGH THE AERIAL PASSAGES OR CAVITIES, we appear to have, I think, very satisfactory evidence. Clothed as the

animal's skin everywhere is with hair, we can hardly imagine such a thing as *cutaneous* absorption; and in respect to the alimentary passages, it has already been shown that substances deleterious in the extreme when applied to the skin, become innocuous when introduced into the stomach; and glanderous matter has repeatedly been exhibited by White and others in the form of bolus without effect. The deduction, therefore, naturally is, that the aërial membrane is the medium through which the virus of glanders becomes introduced.

THAT THIS VIRUS MAY LIE LATENT IN THE SYSTEM appears tolerably satisfactorily proved by the case of C 21 troop-horse. Supposing he took the contagion at the time the other horses did—and I really do not see how this can be, with any show of reason or argument, questioned—then the disease must have lain dormant in his constitution upwards of fifteen weeks. Nobody can allege, with any degree of plausibility, that the disease was contracted in the barracks, after the horses' return; for I have never seen such a case in barracks, either before or since; and it is not at all likely a solitary case, and in the form it did—being similar to the others—would have presented itself at one time and not at another.

CLOTHING, PAILS, BRIDLES, HALTERS, &c., may, each and all of them, prove the media of contagion; though none of them, in my opinion, are so likely to convey pollution as is vulgarly imagined. Supposing that clothing—and woollen is very likely to do so—harbours the contagious virus, unless it were put directly in the way of the animal's nostrils, so as to fairly admit of any effluvia arising from it being inhaled, there is not much risk of its propagating the contagion. And as for pails, they are in general kept free from pollution by continual ablution. Bridles and halters left uncleaned after use about glandered horses would be more likely to contaminate the next wearers of them: still, remembering the several circumstances required to favour the operation of contagion, we should say the chances of escape exceeded much those of transmitting the disease.

CAN GLANDERS BE PROPAGATED THROUGH THE MEDIUM of THE AIR, or through the breath of the horse? On this mysterious and important question a good deal of wide difference

of opinion has prevailed, as will have been seen from the perusal of the abstract we have given of the various notions entertained by veterinary writers on the subject of contagion. For my own part, I neither put faith in the assertions of those who tell us that the glanderous virus infects the very (out-of-doors) air, nor in the doctrine of those who would deny the possibility of communicating the disease save through actual inoculation or transmission of consistent matter. I think, myself, it is *possible*, though a very unlikely incident, that the air may become the medium of contagion; inasmuch as for it to prove so, I should say it was requisite the current of the diseased animal's breath should pass direct, and undiluted with the common air, into the nose of the sound horse, as we know does take place at the time that horses approximate each other's noses, and smell or sniff one at the other by way of recognition, &c. : in such an impregnated condition, charged with the effluvia it has received in its passage over a large superficies of discharge and ulceration, I can conceive it possible, and under certain favouring circumstances probable, the air may become the transmitting medium of glanders; but certainly under none other. Indeed, if we come to consider, the air ought to be regarded as the communicating medium in the case of stables, &c. I have before represented how unlikely it is for matter in any sort of substantial form to obtain ingress into the inside of the horse's nose; and have given it as my notion of the pollution, that it was, in fact, *mediate* contagion: the effluvia generated by moisture and heat from the desiccated besmearments proving the mephitic agents. And besides, glandered and farcied horses standing in stables or other places with confined atmospheres may by their breath and exhalations contaminate the air to that degree that it may possess poisonous power enough to disease other horses. The probability, therefore, is, that the air plays a more important part in the ordinary work of contagion than we are in the habit of imagining.

IS CHRONIC GLANDERS CONTAGIOUS? Some of the continental veterinarians deny that it is; while there are others who entertain doubts concerning it. They allege that the secretions in acute glanders are acrid and irritating compared to the

discharges of the chronic disease, and that the latter, from their mild character, do not appear capable of propagating the contagion. I have already broached an opinion, that the strength or contagious property of the discharged matters, in all probability, varies according to the stage, form, &c. of the disease. I think also, our observation and experience confirm this account of the acute being a more contagious disease than the chronic; at the same time we must remember, the fact of the communicability of the latter through inoculation has become established, and also that there are examples enough on record to prove that glanders, though chronic or insidious in its aspect, has the power of propagating its contagion to horses in health, producing in them acute glanders and farcy. Although, therefore, less danger is to be apprehended from a horse having chronic glanders than from one having the disease in an acute or sub-acute form, we are by no means warranted in treating the subject of chronic disease as though no contagion could be caught from him; on the contrary, such precautions should be taken in regard to him as may prevent his intercourse with sound horses; leading which segregated life, he may, and will do work, it is probable for years, without showing any signs of failure, or growing anywise worse in his ailments.

TO CONCLUDE WITH MY OWN OPINIONS on the subject of contagion, they are shortly these:—I have no more doubt of glanders being a contagious disease than I have of syphilis or small-pox or itch being contagious. At the same time, from the known fastidiousness of contagion in regard to its operation, and from the several collateral circumstances required to ensure its effect in the case of glanders in the horse, in the generality of instances the chances of escaping under its influence greatly, I believe, exceed those of contamination. The comparatively few examples that any of us can adduce of contagion, even after an experience of many years, in my mind seem to warrant this inference; at the same time, these examples are fully sufficient both to establish the fact and warn us against running any risk of propagating the disease. The lamentable as well as discreditable difference of opinion that has hitherto existed on the contagiousness of glanders seems to have arisen out of

the narrowness of the circuit of observation whence the deductions have been made: one man's practice may not have furnished him with any well-marked examples of contagion, another's may have shown him several; the former infers that glanders is a disease of self-origin, the latter that contagion is its source; both too precipitately and confidently running to their opposite conclusions. Let us hope, however, now that our sphere of observation and experience is becoming so much enlarged by the contributions of fellow-labourers, both in our own and in foreign countries, that we shall approximate in our opinions on this vitally important question; and, as a humble step towards such desirable agreement, I believe the conclusions I have, after a good deal of deliberation and some experience, come to here, will not be found widely diverse from the opinions entertained by the majority of veterinarians whose works or words are, at the time I am writing, known to us.

THE MIASM OF THE STABLE.

THE late Professor of the Royal Veterinary College, as has been shown by extracts from his lectures on Glanders and Farcy, was a great non-contagionist in his opinions, not believing that "one horse in a thousand, or even in ten thousand, caught the disease from contagion;" but that the ordinary and almost exclusive source of glanders and farcy was what he called the *poison*—what I have here denominated the *miasm*—of the stable: "a poison generated," he said, "in a confined atmosphere, out of exhalations from the breath, the dung, the urine, and the perspiration of horses pent up in it." And in support of this theory of general and almost exclusive causation he had collected many facts which, with great ingenuity and force of reasoning, he shaped into arguments admitting of the following classification:—

First: the Professor argued, since nothing short of *immediate* contact could, in his opinion, produce glanders by contagion, and since, even then, abrasion of the touching surface or inoculation in some way or other was, he thought, required, the disease could rarely, according to his notions, be propagated in any such manner.

Secondly : that the *first* horse that ever became glandered could not possibly have contracted the disease through contagion.

Thirdly : that several well-authenticated instances stood on record of glanders and farcy having broken out (in an epidemical form) among horses who, in apparent health at the time, had been placed in new stables or on board new ships ; and that such sudden and general attack of the disease had been satisfactorily shown to be owing to want of due ventilation.

Fourthly : that where such *fomites* of infection had been destroyed, places, before to the utmost degree unhealthy, had been rendered perfectly salubrious by the introduction of proper ventilation.

Let us examine these alleged facts, together with the ingenious and plausible arguments our late Professor founded upon them.

Coleman's talents were of an order that gifted him with a ready and acute perception of things in general, enabling him often to discover cause and design where, to those around, all seemed buried in mystery. This penetrative and fertile genius of his, however, would at times lead him beyond the limits of fair and legitimate deduction into regions of theorization where his best friends felt loth to accompany him : he had at the offset, perhaps, framed a pretty and truth-looking theory ; but too often would he mar the fair image he had created by loading it with more accountability than it was able to sustain. Thus it was with the point of hippopathology now before us. He succeeded in proving to the minds of most, if not of all veterinarians of his time, that the poison or miasm of the stable was a fruitful source of glanders and farcy, and that it was especially operative when those diseases broke out, and on a sudden, in an *epidemic* form ; but he refused to admit the influence of contagion in any case, save where actual contact and abrasion, tantamount altogether to inoculation, could be proved to have taken place. In every other instance of alleged contagion brought before him he could discover some want of ventilation, some source of "poison," and to such an extent did he carry the omnipresence of this supposititious poison, that I have heard him say that horses at pasture even might, by sniffing over parcels of dung or places wetted by urine, in the open fields, in-

hale it in as efficacious a form as though they had inspired it generated in their stables. Consistently with which notions so far did he carry his plans of ventilation, that he thought open sheds in straw-yards should have apertures for the admission of pure and the emission of impure air, the same as stables themselves. And yet, non-contagionist as Coleman was in his opinions, the regulations issued from time to time at his suggestion for the guidance of the veterinary surgeons of the army were, in their nature, as effectually calculated to prevent the spread of the disease by contagion as any one of an opposite way of thinking could possibly desire, as will appear by the subjoined extract from them, received by me in the month of October, 1837 :—

Extract of a Report from the Principal Veterinary Surgeon.

“I have always considered it the duty of all commanding officers and veterinary surgeons of cavalry regiments to report to the respective barrack-masters any and every stall occupied by a glandered horse, and requiring painting, &c. and, in my opinion, those stalls or standings only, occupied by horses with symptoms of glanders, require being painted in oil, but that the whole of the racks and mangers should be thoroughly washed with soft soap and hot water well softened by soda, and which I have no doubt, if the stables are properly ventilated, will prevent all danger from infection. Glanders is much more frequently produced by defective ventilation of stables than by glandered matter.

(Signed)

“EDWARD COLEMAN, P.V.S.”

If it can be shown, beyond any reasonable ground for doubt, that glanders may be, and not infrequently is, taken through *mediate* contagion, through stabling, &c.—and I think enough has been advanced in these pages to demonstrate, at least, the plausibility of such a deduction—then Coleman’s first argument sustains so much weakening, that the miasm of the stable no longer can be regarded as the *universal and exclusive cause* of glanders and farcy which he in his enthusiastic prosecution of his schemes of ventilation imagined it to be, but must descend in the grade of causation, to take no more than its due share in the production of the disease, along with other equally well-grounded and recognised causes.

Secondly : that Coleman established his great point, that glanders and farcy *did* originate independently of contagion,

there is no question. Setting aside the necessity of actual contact, and the improbability of horses coming together in such manner as to catch the disease through inoculation one from another—neither of which positions would experience suffer Coleman to maintain;—setting aside, also, the posing query ever put to contagionists, “Whence did the *first* glandered or farcied horse take the disease?” there is ample evidence on record to demonstrate that foul and ill-ventilated stabling has proved a fertile source both of farcy and glanders;* and to Coleman the greatest credit is due for the masterly and persevering manner in which he discovered and exposed this *fomes* of infection, and for never, after his discovery of it, leaving it—so far, at least, as the cavalry and ordnance stables were concerned—until he had cleansed it out from the very bottom, and, in the place of a heated and polluted atmosphere, filled the public stables with currents of cool and pure air—with air that was wholesome for the horses to breathe, in the place of that which was pregnant with miasmatic vapours: continually charged, as the unrenewed atmosphere of the closed-up stable must have been, even in the daytime, but especially by night, with carbonaceous exhalations from the lungs of its inhabitants, and ammoniacal and other noxious effluvia from the urine, the dung, and the perspiration. To neutralise or expel this miasm constituted Coleman’s *principle of ventilation*;—this was the object he ever and always had in view. How far his plans for effecting it were judicious, or the best that could, under the circumstances, have been devised, is quite another question: that, in general, they proved successful, is in a measure shown in the comparative infrequency of glanders and farcy at the present day. I say, *in a measure*, because we have had no reason to take it for granted that contagion had no, or even comparatively small, influence: whatever share it might have had, however, in the causation, it is not likely that Coleman, intent as his

* M. Patu, M.V. to the 4th (French) Cuirassiers, ascribes the extraordinary prevalence of glanders and farcy in the French cavalry to the crowding together of the horses in small, low-pitched, ill-ventilated, dark, damp stables; and finds great fault—not without reason—with the authorities for not affording proper and healthful accommodation.—(‘Veterinarian’ for 1836.)

mind ever was upon his favorite theory of stable "poison," would have heeded it.

To my mind, however, Coleman's own reasoning on the *modus infectandi* of this poison is in every way sufficient to prove that the disease, once generated, is capable of spreading by contagion, and through the medium of the air, too, from one horse to another. If the atmosphere of the stable, charged as we know it to be with humidity, can carry a miasm from the excretions and secretions into the nose of the horse, sufficiently concentrated to produce glanders and farcy, is there any good reason why the same atmosphere may not convey the virus of glanders itself, emanating from the nose or lungs of a glandered horse, or from the open buds of a farcied one? Surely, that which can conduct poison from the dung or urine upon the floor of the stable, can transport virus from one horse's nostrils into those of another;—and, surely, the virus emanating from a chancreous surface must be as virulent and efficacious as any generated in the dung, the urine, or the breath of horses in health.*

Thirdly: no doubt has ever been entertained by me of the spontaneous origin of glanders and farcy—of their origin apart from the influence of contagion. Coleman, whose field for observation was greater than almost any man has enjoyed either before or since—he having had the Army, the Ordnance, the Veterinary College, and some private practice besides, to range over—adduced much satisfactory evidence in proof of this fact. He showed that these diseases, on several occasions, had made their appearance in situations never inhabited by horses before, and then, for the first time, by horses at the time of their entry in apparently perfect health; in new, public and private stables, and on board of new ships.† And he said that the morbid

* "A glandered horse may contaminate the air of a stable to such a degree that horses breathing the same air may become infected with the disease, although the infected may never come in contact with the infecting horse. Fortunately, glanders is not so infectious as some other diseases to which horses are liable, otherwise the breed would soon become extinct."—*Vide* an admirable article "On the External Causes of Disease," by W. F. Karkeek, V.S., Truro, in 'The Veterinarian' for 1833.

† Although some doubt has been cast "by an old military officer" on Coleman's account of the Quiberon expedition,—(see 'Veterinarian' for July, 1840,) yet has

agent was the poison the healthy inhabitants of such uncontaminated abodes themselves generated, by being shut up without due or proper ventilation.

SMITH contended as strongly as Coleman for the origin of glanders independent of contagion, and admitted how frequently and commonly the disease broke out in foul and unventilated stables; but he ascribed the mischief to the consumption and consequent *deficiency of pure air*,* and not to any specific poison. Coleman, however, had from the first suspected this cause himself, and immediately set about the investigation of it; and the result of his inquiry was, that—to use his own emphatic language—“the air of the closest alley in London was found to contain as much oxygen in proportion as the air that encompasses the hills of Highgate;” showing him that there was no good ground for believing that the atmosphere of the close stable possessed less pure air than that out of doors; and serving to confirm him in his opinion of what was the real deleterious agent, which was *the animal poison*.

Fourthly: that, as I observed before, Coleman’s introduction of ventilation into the stables of public and private establishments has been productive of incalculable benefit, admits of no question whatever: not only has it proved prophylactic against glanders and farcy, but against other diseases as well; and were the profession and the public indebted to him on no other account, the good arising from ventilation alone is sufficient to preserve his name, for many a year to come, in the records of veterinary science.

WHAT THE NATURE OF THIS MIASM OR INFECTION IS.—Whether it be similar in its essence to the virus of glanders itself, or whether it simply be an irritant of that miasmatic description that empisons the system, and breeds malignant disease somewhere, depending for the form in which it breaks out upon certain local susceptibilities, producing one disease in one part, another disease in another part, we have no direct or positive evidence to show. Coleman was clearly of opinion that, though

the fact of glanders having broken out on board of ship been attested by Mr. Mogford (see ‘*Veterinarian*’ for August, 1840), as well as by Smith, at page 213 of the present volume.

* See his account of this at page 210 of the present volume.

specific he considers "the poison," it was *general* in its operation: he not only ascribed glanders and farcy to its influence, but *rabies** likewise, and also periodic ophthalmia and

* On the occasion of the Professor being examined before a Committee of the House of Commons, touching the Bill to prevent the spreading of Canine Madness, to the question, "Have the goodness to state what (in the course of many years' experience) has occurred to you?" He gave the following answer:—"I have made up my mind on one point, in which many people, however, are of a different opinion,—that the disease is often produced without contagion."

"Spontaneously?"—"Yes; but when I say spontaneously, I believe that to arise in consequence of the fact of their being exposed to their dung and urine, and to confinement, too much feed and too little exercise. I do not believe that carrion flesh is capable of producing it, but I think it arises more from being confined, tied up, and exposed to their own dung, and their own urine, and their own breath, and also from the want of proper exercise. I believe that, with hounds in kennels that are properly attended to, it is rather an uncommon disease; but when the kennel has not been attended to, canine madness sometimes takes place, of which I know one instance in particular: the subscription pack of fox-hounds in Surrey had the disease to a considerable extent, and there was one remarkable fact, that the dogs did not bite the bitches, nor the bitches bite the dogs. The kennel had been very much neglected; there was no water flowing through the kennel: I suggested improvements in that respect, and the disease for a length of time disappeared."

"In the cases you are now speaking to, have you examined the dog after its death in any case where the dog has not been bitten?"—"It is impossible to prove the negative: we cannot say the dog has not been bitten; but if it did always arise from the dog being bitten, how came the first dog to be mad? But, independently of that fact, it will be found, that in different parts of the country, you hear nothing of hydrophobia, and then you hear of it in different parts of the country pretty nearly at the same time. Now there are many diseases highly contagious in themselves, but which are capable of being produced without contagion. The glanders can be thus produced—it is a contagious disease; and so is farcy; and yet it is a fact that these diseases are more frequently generated than propagated by contagion. The itch also is notoriously produced by filth, and, when produced, becomes contagious; so with ship fever and gaol fever, which, when they break out, become contagious; but they can be generated."

"Would the glanders be produced by inoculation in the case you refer to?"—"I can mention one extraordinary instance, which was in the Quiberon expedition: there were a great many horses examined, prior to their going out, and not one of them had any apparent disease: they were put on board different transports; they encountered a hurricane; they were obliged to put down the hatches; several horses were suffocated, and great numbers of them became

grease. Supposing the existence of a *virus* in each one of these diseases, nobody would contend they were all four of the same nature, or that the diseases themselves differed—no more than farcy and glanders differ—only in being seated in different parts or tissues; therefore, when Coleman asserted that the same poison that produced glanders would produce ophthalmia, grease, and rabies, it is manifest he could have regarded the poison but in the light of a common though malignant infector.

There is no absolute need to suppose that the infection or miasm generated in the atmosphere of the stable, and believed to be the producer of glanders and farcy, is the same as the contagious virus of glanders itself: it may be a sort of *malaria*, the result of the decomposition of animo-vegetable matter, or else of a compound of mephitic vapours positively injurious of themselves to the mucous membrane of the nose and air-passages, independently of any exclusion or diminution of the oxygen of the confined air. And as a poisonous agent, it may either prove at once noxious to this membrane itself, or, through its medium, become absorbed and carried into the circulation, contaminating the blood, and breaking out in the form of *farcy* in some horses, in that of *glanders* in others; and capable—the same as *malaria* is thought capable of producing fever in some persons, cholera in others—of producing according to Coleman, *ophthalmia* and *grease* as well, and even, in the dog, *rabies*. Whatever plausible reasons there may be, however, for believing that what will produce glanders and farcy, the same may create ophthalmia and grease, there do not appear to be any examples of the *spontaneous* origin of rabies: the only

glandered in consequence. At Dover, in the year 1796, where there was a great encampment, the government could not get stables to receive them late in the autumn: they built close and confined stables; and the most healthy horses went into those new stables, and a great number became glandered, affected with farcy or diseases: a great many of them died. Many of the horses were sent to Hythe and placed in an open shed; not one of these horses became affected. It was certainly intended that animals with lungs should have an element to breathe once, and but once, and that the air should receive something from the blood, and impart something to the blood; but that, when made to go several times into the lungs, it produces a disease which becomes infectious. In the human subject, it produces fevers and the plague, and farcy and glanders in horses, the pip in fowls, and the husk in pigs.”

argument in support of such a presumption being the hackneyed question of, how the *first* case of rabies came to appear.

OTHER CAUSES OF GLANDERS.

THAT both glanders and farcy have on occasions taken their rise from other causes than contagion and the miasm of the stable, there is on record ample evidence to prove in the face of all mere assertion to the contrary ; and this will account for the number and variety of causations we find enumerated by authors in their descriptions of the origin of the disease as it happens to have occurred within their own particular sphere of observation. Looking over the accounts of different writers, we find glanders ascribed to contagion, to infection from the miasm of the stable and other sources, to transitions from cold to heat and from heat to cold, to suppressed perspiration, to sudden immersion in cold water, to humidity of the atmosphere, to want of exercise, to over-work, to bad forage, to water of some particular quality, to locality, to marasmus or debility, to fulness of condition, to wounds and other injuries of the head, to previous disease, &c.

Such of these divers alleged causes as rest upon any good ground of authority admit of distribution into three classes, which we have already specified and numbered among our general causations as third, fourth, and fifth classes.* The perusal of these will show it is our opinion that for any cause of a common description to produce glanders or farcy, that cause must operate against a constitution predisposed to take on such a diseased action. Mr. Vines views this predisposition as consisting simply in *unhealthiness* ; for our own part, however, we rather side with Dupuy, and fancy there must exist somewhere in the body the seeds of lymphatic or tubercular disease, waiting only for the requisite amount of excitation to lead to their development in the form of glanders and farcy. Were mere unhealthy state of body all that was required for a cause of an ordinary nature to produce glanders or farcy, the disease would, surely, be a great deal more prevalent than we now find it. How far a common cause acting with inordinate severity or

* At page 218.

suddenness might occasion either glanders or farcy, is another question: that such cases have produced effects *semblant* of such diseases we are well convinced; but, that these results were veritable glanders and farcy, admits, in our opinion, of considerable doubt. Once let glanders and farcy be the acknowledged result of a common cause acting upon a body free from all specific predisposition created by taint or pollution, or by lymphatic temperament,* and the door is thrown open to the admission that glanders and farcy are producible after the manner of ordinary disease, and that every inflammation of the Schneiderian membrane attended by ulceration and fetid discharge constitutes a case of glanders: in a word, that there is no such thing as *common* lymphatic disease, no other ulcerous affection of the nose save glanders. For these reasons, and for one other, it is that we regard with the greatest suspicion as to their true nature the following cases extracted from the practical work of Mr. Smith on glanders: we cannot, in our own minds, conceive how horses can become "*instantly* glandered," and as "*instantly* affected with farcy." We have no doubt, as we said before, that cold and heat suddenly or intensely applied produce effects such as have been described; but we would not—could not, consonantly with any notions of the *specific* character of such diseases—call them by the names of *glanders* and *farcy*.

"June 22d, 1793, the Second Dragoon Guards (of which Mr. Smith was the Veterinary Surgeon) encamped on the plain of Cysoing. The weather was extremely hot. In about a fortnight afterwards, however, they experienced a few days of incessant rain, accompanied by a high wind in consequence of which many of the horses in two troops that faced the wind became severely affected about the head. In four cases, the nostrils were rendered quite impervious, which occasioned their death; and several others that were less affected, became instantly glandered. But in the other two troops, where the horses stood in a contrary direction, no case of the disease took place.†

CASE II.—"August 16th, 1806, the same regiment paraded in marching order on the Hoe, at Plymouth, at three o'clock in the morning. The horses remained there upwards of five hours, without moving, during which time they were exposed to a very heavy fog. The consequence of which was, that four young

* Read Rodet's 'Account of Glanders,' at page 271.

† 'The Horse Owner's Guide.' By T. Smith, V.S., Second Dragoon Guards.

horses that stood without saddles or cloths were instantly affected with farcy, and one of them exhibited symptoms of glanders also. Those affected with farcy recovered : the other was shot.*”

That glanders and farcy have epidemically prevailed in humid atmospheres and in damp stabling seems no longer matter of doubt.

“An innkeeper at Wakefield built some extensive stabling for his horses ; but, from inhabiting them too soon, he lost a great proportion of his cattle from glanders. At present there are no more healthy stables in the place. The immense range of stabling under the Adelphi in the Strand, whereto light never enters, and the supply of fresh air is not too abundant, were for a long while notoriously unhealthy, and in them many valuable horses were destroyed from glanders ; but now they are filled with the finest waggon-horses the metropolis or country contains, and they are fully as healthy as the majority of stables. In a French journal, an account is given of a cavalry regiment, while quartered in a low humid situation, and lodged in damp stables, losing in that year thirty-one horses from glanders. They moved into a dry situation, and better constructed stables, and their loss the following year amounted to but a single horse.”†

Formerly there existed many posting and coaching establishments that might truly be said to be *fomites* for farcy and glanders : now, however, that the number of these establishments is diminished, and that things are better ordered and managed in such as remain, we fear but little in comparison about their being annoyed by these diseases. Coleman would have said—and probably with great amount of truth—that all this was owing to defective ventilation, drainage, &c. Unwarped, however, by love for any theory in particular, we ourselves would probably have attributed some of the cases of the disease to contagion, and others—a few though these might be—to over-exertion. Whether, however, we should be correct or not in applying such causation to this particular case, we have no hesitation in ranking *over-exertion* among the causes of glanders, however low down in the catalogue it may stand, because we have seen some and heard of more horses that have turned farcied and glandered after severe runs in the chase. It is an occurrence probably more likely to happen to an aged than to a young horse.

* ‘The Horse Owner’s Guide,’ by T. Smith, V.S., Second Dragoon Guards.

† Mr. Youatt’s Veterinary Lectures in ‘The Veterinarian for 1832.’

“In 1805, while the Second Dragoon Guards were encamped on the Curragh of Kildare, a very old horse was ridden throughout a very fatiguing field-day, during the former part of which the weather was extremely hot, but changed just as the troops returned to the lines, and continued very cold all night. The regiment being ordered out again next day, the same horse was mounted in the morning as usual, no indisposition having been observed in him until he came to the troop parade, when a hæmorrhage from both nostrils was discovered. Being in the lines I (Mr. Smith) saw him in this state, and found the mucous membrane very much inflamed and ulcerated about the extremity. There was no cold or previous discharge from the nostrils.”*

Injuries about the head, from blows or falls, have on many occasions given rise to symptoms that might, in ignorance of the lesion itself, be mistaken for those of glanders.

A valuable chestnut hunter was sent to Mr. Jos. Sewell for his opinion, supposed to be glandered, from his having had for six weeks a considerable discharge from his off nostril, with enlargement of the submaxillary gland. On examination, Mr. Sewell discovered his patient had received a contusion upon the off frontal bone, and this induced him to propose trephining him. This led to the discovery (as was supposed) of a fracture, and to the exposure of a splinter of bone suspended from the membrane, lining the frontal sinus. The wound, after being closed, was syringed with astringent lotions; and in five weeks afterwards the patient had recovered, very little blemished.—*Veterinarian for 1840.*

Carious teeth, and disease of the maxillary bones and of the sinuses, have generated a similar set of delusory symptoms.†

It is surprising what trifling and strange causes may now and then be assumed to be influential in attacks of glanders or farcy. In the case following, simply a dose of cathartic medicine appears to have done the mischief:

“February 2d, 1806, a dose of physic was administered to a young horse (belonging to the Second Dragoon Guards, Mr. Smith being their Veterinary Surgeon), which was taken the following day from Birmingham to Coventry, the troop to which he belonged having marched there. The unfortunate animal was led eighteen miles under a violent purgation, exposed all the while to an intense frosty wind. He became instantly glandered from ear to lip. The skin

* Smith's ‘Horse Owner's Guide.’

† Turn to pages 176-180 of the present volume.

on that side of the head most exposed to the wind appeared as though a mild blister had been applied to it." *

In another instance *castration*—in general a simple and safe operation in the young horse—was followed by farcy and glanders; and the owner of the colt refused, in consequence, to pay my father—who was the operator—his charge for the operation.†

SEAT AND NATURE OF GLANDERS.

In pursuing our investigations through the division of our subject at which we are now arrived, we anticipate more difficulty in coming to sound pathological conclusions than we experienced in agitating the question of the *contagiousness* of glanders. We shall set about the inquiry by first showing what progress our science has made in developing the true seat and nature of the disease, by—as on a former occasion—collecting the accounts of authors on the subject from the earliest periods down to the present; and this will be found to furnish us with a body of information from which we may, at least, safely deduce two facts, which are—the veterinarians of the present age are pretty generally agreed as to the *seat* of glanders, though, touching its *nature*, almost every point of the pathological compasses of humourism and solidism seems to have been, at one time or another, touched at by them, by way of affording some sort of satisfactory explanation of the phenomena exhibited by glanders and farcy.

Lafosse (senior) in his "preface" to his 'Treatise upon the true seat of Glanders in Horses,' states, that "great was his surprise, when he found that such distemper was not only *unknown to the ancients*, but that it was altogether a *new disorder*, and did not appear in Europe till about the year 1494."—" 'Twas at the siege of Naples, after the arrival of the Spaniards from their discoveries in America, that glanders in horses appeared for the first time."

"PARAZZER is the first author who has mentioned it—he

* Op. cit.

† The case will be found in the second vol. of the present work, p. 427.

himself was at the siege ; and the Spanish authors are the first who have given us the history of this disease, which they term MUORMO.”*

Dupuy, however, in his prefatory history—‘Partie Historique’—contradicts this account, on the authority of MM. Masse and Jourdain, two French veterinary writers, who have been at the pains to translate the writings of the Greek hippiatrists, and from whom, he says, we learn that the father of medicine himself, Hippocrates, was acquainted with the disease, and has, in its confined stage, pronounced the malady incurable.

VEGETIUS, who wrote in the fourth century, has described one disorder he has called *morbis humidus*, and another he has named *morbis farciminosus*, the former of which some of his veterinary interpreters have said was *glanders*, the latter *farcy*. His descriptions, however, to say the least about them, are very vague and indefinite, at one time seeming to mean something more, at another something less than glanders and farcy.

“The humid disease (*morbis humidus*) is when from a horse’s nostrils, instead of snot, there flows a stinking and thick humour, of a pale colour. A horse thus affected has a great heaviness in his head, and hangs it down. The tears fall from his eyes, and there is a whizzing noise in his breast. He becomes thin and meagre, with his hair standing on end, and of sad aspect. This disease the ancients called the ATTICAN FLUX, or running at the nose. But whensoever a bloody humour or like to saffron begins to flow from the nostrils, then he is incurable, and near death’s door.”†

LEONARD MASCAL, 1587, our earliest writer, like the ancients, had no correct notions of glanders as a disease by itself. He tells us, “glanders are kernels under the jawes, and when they be ripe, they will run at the nose and there break out.”‡

* ‘A TREATISE upon the TRUE SEAT OF GLANDERS IN HORSES, together with the METHOD OF CURE,’ &c., with cuts. By M. De La Fosse, master farrier of Paris and farrier to the King’s Stables, 1751.

† ‘Vegetius Renatus, of the Distempers of Horses,’ translated into English by the author of Columella. London, 1748.

‡ ‘The Government of Cattel,’ divided into three Bookes. Gathered by Leonard Mascall. London, 1620.

BLUNDEVILLE, 1609, writing in the reign of Queen Elizabeth, the next authority we have, I believe, extant on the subject before us, appears to have made some progress in the knowledge of the fluxes or humid diseases of the ancients, for he instituted distinctions between *glanders* and *stranguillion*, though he treated them both alike. He imbibed Theomnestris's notion, that *difference of colour* in the nasal discharges constituted a *difference in the disease itself*. He thought "glanders" originated in *cold*, and that "last of all" came "mourning of the chine."*

GERVAISE MARKHAM, 1630, was equally in the dark. He imagined the difference between strangles and glanders to consist in one breaking *outwardlie*, the other *inwardlie*.†

DE GREY, or DE LA GREY, 1740, adopted Solleysell's notion of glanders proceeding from neglected cold, distinguishing the disease "by the inflamed kernels or knots which may be felt under the *chaul* of the horse." He, however, continued in the old error, of fancying that "the thinne rheume ascendeth up to the head and setteth neere to the brain, and so venteth itself at the nose:" the cold gradually getting worse and ending in glanders.‡

SOLLEYSSELL, 1669, a French writer of this period, of excellent repute, still considered glanders as related to catarrh, though he did not suffer himself to be misled by the difference of colour the nasal discharges assumed. Neither did he think—as those before him had imagined—that the discharges proceeded from the brain, but from the lungs, liver, and spleen. He thought glanders was "caused and fermented by an ulcer in the lungs;" which, increasing, consumed those organs, and at length killed the horse.§

* 'The Four chiefest Offices belonging to Horsemanship: that is to say, The Office of the Breeder, of the Rider, of the Keeper, and of the Ferrer.' By Master Blundeville, of Newton Flotman, in Norfolke, 1608.

† 'Cavelarice; or that Part of the Arte wherein is contained the Knowledge or Office of the Horse-Farrier, with the Signes and Demonstrations of all Manner of Infirmities, and the most Approved Cure for the same.' The Seaventh Booke, 1607-1676 (numerous editions).

‡ 'The Compleat Horseman and Expert Ferrier.' By —, 1740. In one place the author's name appears as De Grey, in another as De la Grey.

§ Op. cit., at p. 198.

LAFOSSE, in 1749, presented to the (French) Royal Academy of Sciences "A MEMOIR OF THE GLANDERS IN HORSES relating to the SEAT of that Disease ;"* wherein, after exposing the errors of those who had written before him, in supposing the viscera—the lungs, heart, liver, spleen, kidneys, &c.—to be the seat of the disease, he informs the Academy that he had found the frontal and maxillary sinuses filled with matter, and "the pituitary membrane inflamed ; and, consequently, much augmented in thickness," and "affected with *sanious ulcers* ; which, in some cases, had corroded through the substance of it to the very bones. That, when horses discharged matter from both nostrils, both sides of the membrane were affected ; and that when they only ran at one nostril, that side only of the membrane was found distempered."

"In like manner he (Lafosse) constantly observed an agreement between *the obstruction of the sublingual glands*, or glands under the jaws, and the affection of the aforesaid membrane ; that is to say, if one of these glands only was obstructed, then the horse discharged matter only by one of his nostrils ; but, on the contrary, if both the glands were affected, matter should be discharged from both nostrils."—"One may (therefore) reasonably conclude, with M.Lafosse," remark the Academicians, "that the glanders does not depend upon a *general distemperature of the blood*, but is really and truly A SIMPLE AND LOCAL MALADY."

In 1752 Lafosse presented the Royal Academy with 'A New Memoir,' "improving and bringing to perfection his discovery." Herein "he distinguishes *seven kinds of discharges* which may come from the nostrils of horses."—"He, also, makes it evident that the true glanders has its characteristics, which essentially distinguish it from every other disease that has been called by the same name."—"And, in order to prove that a great inflammation of the pituitary membrane is always the cause of glanders, he has attempted to bring on an inflammation upon the same membrane *by a corrosive injection* ; and, when the injection was only made on one side, the maxillary lymphatic glands were swelled on the same side, and that nostril only

* The 'Memoir' is appended to his work, published two years after. See title of work, given at page 252.

produced the discharge. But, on the other hand, when both nostrils were injected, these symptoms appeared on both sides.” —“The first Memoir presented by Sieur Lafosse was confined to a bare description of the disease, and only a proposal of a method of cure by way of project; but, in this, he certifies that *he has cured several glandered horses* by means of his injections and fumigations thrown into the nostrils.” *

LAFOSSE, JUNIOR, 1775, strongly advocating his father's doctrines, contended that the most conclusive and satisfactory evidence of their truth was afforded by repeated autopsies, and by the well-known experiment so often made by his father, as well as by himself, of throwing corrosive injections upon the pituitary membranes of horses, and of so turning them glandered. He shaped his father's pathology to the improvements medical science had in the interval undergone, and made some alterations in the divisions of glanders, calling them *proper and improper—primitive and secondary—incipient, confirmed, and inveterate—simple and compound*. He would not admit that the lungs participated in glanders, save from the supervention of pulmonic disease during its existence. But he allowed that the *frontal* and, occasionally, the *maxillary sinuses*, together with the *cornets and ale of the nose*, partook of it. It was some time, however, before he discovered that the tumours under the jaw were *not salivary*, but *lymphatic* glands.†

MALOUIN, 1761, appears amongst the earliest dissentients to the generally-received doctrine of Lafosse. He presented the French Academy with the results of his own observations, tending to show that *other parts*, besides the pituitary membrane, became involved in disease; and that the longer the duration of glanders, the greater the number of other tissues found affected by the disease.

GIBSON, 1754, describes glanders to consist in “a malignant ulcer formed in the inside of the nose of the horse”—“generally accompanied by a swelling of the kernels under the jaws. The matter discharged is, for the most part, either yellow or greenish, or tinged with blood; and, when horses have been

* ‘Observations and Discoveries made upon Horses,’ &c. By Sieur La Fosse, Farrier to the King of France, 1755.

† Op. cit., at page 199.

long glandered, that the bones and gristles are grown foul, the matter turns to a blackish colour, and becomes very fetid and stinking. And this is what usually passes for *the mourning of the chine*, from a mistaken notion of corruption and putrefaction of the brain and spinal marrow.”—“But the most common and usual kind (of glanders) does not proceed from any of these causes,* but from *a bad disposition in the blood*; which, perhaps, continuing for a considerable time unperceived, at last shows itself by a swelling of the glands under the jaw-bones, and a running at the nose, *without any other visible sign of sickness or disease*; and this is “*what properly constitutes the glanders in the horse, and is either of the scrofulous kind, the same with the evil, or else cancerous; both of which I have met with in practice, and may be either hereditary, or the effect of hard labour and bad keeping.*”†

REEVES, a farrier at Ringwood, Hants, who about this time, 1763, published a veterinary work‡ under the eye of a physician, looked upon glanders, as Lafosse did, as “properly an inflammation of the pituitary membrane;” running into the same errors about the “kinds” of glanders as Lafosse did, and adopting his mode of cure by injection.

* Not having had by me Gibson’s work at the time I was giving others’ opinions of the “causes of glanders,” I may be excused for introducing this author’s notions of the origin of the disease in this place. Gibson thought glanders “sometimes proceeded from *colds* ill cured;”—“sometimes from strangles:”—“from an epidemical fever” occasionally; from “hard labour and bad keeping.” It is “the most infectious of all distempers;” and is “certainly so at some seasons more than at others. However, I have known glandered horses stand a considerable time along with sound horses through negligence or ignorance of the distemper, thinking it only to be an inveterate cold, and yet no harm happen. On the other hand, I have known a glandered horse infect every one that has stood near him in the same stable; and I have also known sound horses carried into a stable where glandered horses have stood, and by that means caught the infection, though the stable has been cleaned and aired before they were brought into it; and other horses, that have been set up along with them in the same stable, and the very stalls where the glandered horses stood, have escaped the infection.”—(Op. *infra* eit.)

† ‘A New Treatise on the Diseases of Horses,’ by Wm. Gibson, Surgeon, 1754, 2d edition.

‡ ‘The Art of Farriery, both in Theory and Practice,’ &c. &c., by Mr. John Reeves, Farrier at Ringwood, Hants. The whole revised, corrected, and enlarged, by a Physician. Second edition, 1763.

BRACKEN, 1769, assures us, he “cannot describe the glanders better than Mr. Gibson has done: to wit, ‘that it is a flux or running of corrupt matter from the nose of a horse, which matter is of different colours; as white, yellow, green, or black, according to the degree of malignancy, or according as the distemper has been of long or short continuance.’”—“I know but of one *inseparable* sign of glanders, and that is inflammation or swelling of the glands about the throat or *behind the ears*. And as to what Solleysell, Blundeville, and others, write about *the mourning of the chine* or consumption of the brain and spinal marrow, &c., it is a pack of nonsense.”—“I take Mr. Snape’s account of the glanders not to be very defective; only I cannot agree with him in one thing, that is, *in this distemper’s being contagious or infectious*; for he might as well say that *we catch colds, consumptions, &c., by infection.*”*

BARTLET, 1773, a surgeon, who wrote a veterinary work about the same period, became another of Lafosse’s proselytes. “A new light,” he tells us, “having been thrown on this whole affair by the study of M. Lafosse, the King of France’s farrier, who has been at the pains to trace out and discover, by dissections, the source and cause of this disorder; we hope the method he has proposed, with some farther experiments and improvements, will soon bring to a certainty the cure,”† &c., &c.

BOURGELAT, 1765, the great founder of the French Veterinary School, saw reason to secede from the notions of Lafosse, which, in his day, had firm hold of public opinion. He believed glanders to have its source in *the corruption of the blood* and humours of the body, and thought there was great analogy between the ulceration of glanders and venereal chancres.

PAULET, however, as we learn from Hurtrel d’Arboval,‡ was the French writer who especially drew attention to the similarity there existed between glanders and syphilis. “The two viruses,” he says, “exert their action in a similar manner: in both diseases, the lymph, contaminated through the presence of the virus, in its turn infects the gland in the neighbourhood to which it has been taken. In one case it happens to the

* ‘Farriery Improved,’ by Henry Bracken, M.D., 1769.

† ‘The Gentleman’s Farriery,’ by T. Bartlet, Surgeon, 8th edit. 1773.

‡ Op. cit., at page 217, article, “Morve.”

glands in the groin, in another to those in the throat; both performing the same office. The two viruses, acrid and irritating in their nature, having reached in one instance the urethral canal of man, in the other the cavities of the head of the horse, lined by the pituitary membrane, and being there dissolved and decomposed, occasion by their presence irritation, inflammation, burning, speedily followed by purulent flux, together with augmentation of the natural mucous secretion."

GILBERT, another French veterinary writer, regarded the knowledge of the means of *preventing* glanders as hardly less in importance to the discovery of the cure for the disease. His notions, like Solleysell's, were that both strangles and bastard-strangles frequently ended in glanders; in fact, that the two diseases were alike, glanders being but an imperfect evacuation of the strangles. But *farcy* being the disease which, of all others, most frequently terminates in glanders, it has received from farriers the appellation of its *cousin German*. Ordinarily, in horses, the disease is of a chronic nature; but on occasions it assumes the acute form. In mules and asses it is constantly acute.*

VITET, 1783, describes glanders to consist in a discharge from the nose of a virulent and contagious humour, in the first stages unaccompanied by fever or cough, or loss of appetite or spirits. The horse, mule, and ass, are the only animals obnoxious to it. The disease commonly commences in one nostril. Its course is very uncertain. The horse may survive one, or two, or even three years. Some regard the *pituitary membrane*, others the *lungs*, as the seat of glanders. For my own part, I willingly class myself with those who think both the *head* and the *chest* the seat of disease. Those who have considered glanders to be a local disease have essayed by injections to accomplish a cure; while the advocates for its being a pulmonary disease have made use of detersions, such as the terebinthinates and balsams; while those who have regarded as its seats both the pituitary membrane and lungs have been as fond of employing internal as external remedies.†

VOLPI, the Italian professor of veterinary medicine suspects

* 'Observations sur les Causes de la Morve,' &c. &c.

† 'Médecine Vétérinaire,' par M. Vitet, vol. ii, 1783.

strong identity in nature between glanders and syphilis. Glanders is so frequently associated with farcy, that many assert they are the same disease. Farcy, however, is much more easily cured than glanders. Glanders is only curable while recent; after it has long existed, the organic lesions occasioned by it render all our remedies of no avail, these said lesions proving the disease to be of an inflammatory nature. It is absurd to consider the submaxillary tumefied glands as the focus of the disease, and to imagine that extirpation of them will tend to its removal.

SNAPE condemns the operation of trepanning, as insufficient to cure the glanders; sagaciously asking, "Can success be expected from the irrational procedure of attempting to remove the defects, previous to subduing the original cause, *which is seated in the blood*, where it is introduced by various means?" This author seems to have had an impression that glanders and farcy were but the same disease; for he says, "the first stage of glanders is *farcy in the head*, and the last stage of a farcy in the head is a *confirmed glanders*."*

TAPLIN, 1791, after, in his own peculiar happy vein of irony, holding Lafosse, and "his trumpeter, Bartlett," up to ridicule for the notions of "the seven different kinds of glanders," and "the cures almost incredible," through trepanning, syringing, &c., that were said to be performed, gliding from the eminence of satire "gently into the vale of reason," informs us, as his own opinion on the subject, "that any corrosive matter discharged from the nostrils, and suffered to continue for a length of time, so as to constitute ulcerations and corrode the bones, will degenerate into, and constitute, the disease generally understood by the appellation of glanders: every stagnant, acrimonious, or putrid matter is possessed of this property, and more particularly when lodged (or by sinuses confined) upon any particular part"—"whether proceeding from an ulceration of the lungs, or the inveterate glandular discharges from the head (where the case is of long standing, and the bone carious), they are equally *incurable*."†

* 'A Practical Treatise on Farriery; from the management of the late Mr. Snape, farrier to their Majesties and to the second troop of Horse Guards.'

† 'The Gentleman's Stable Directory,' by Wm. Taplin, Surgeon, 1791.

ST. BEL, 1792, the first Professor of the Veterinary College of London, adopted the opinions and practice of Lafosse on the subject of glanders; and so, his experiments at Lyons, detailed here after his death, exhibit a series of nasal injections, united with antimonial and mercurial preparations by the mouth, &c.*

THE LATE PROFESSOR COLEMAN made a division of glanders into *acute* and *chronic*. "That form or kind is acute, which, like other acute diseases, proceeds regularly through its course and ends in death; that chronic, which, so long as it continues so, will not destroy the animal. This is illustrated by what happens in chancre, bubo, and (venereal) gonorrhœa: one requires the administration of mercury, the other will in time run itself dry."

"ACUTE GLANDERS may be defined to be, a *specific* inflammation and ulceration of the Schneiderian membrane, more particularly of that part of it covering the *septum*, that appearing to possess a *higher degree of sensibility*. It is generally accompanied by tumefaction of the submaxillary lymphatic glands, which glandular tumour or tumours is simply the consequence of irritation."

"By *specific* is meant, an inflammation not attended with the usual phenomena. If the inflammation could be as well recognised by any characteristic appearance as the ulceration is, then the horse ought to be pronounced glandered prior to the supervention of the ulcerative stage: to this there are analogous instances in the human subject. No surgeon decides on a case of syphilis before chancre makes its appearance, or on smallpox until pustules have formed. We may safely lay claim to two discoveries respecting glanders and farcy. One is, that the whole mass of blood has been found to be contaminated; the other, that both diseases may be, and are commonly, produced without the agency of contagion. Mr. HUNTER concluded that the blood was never in itself diseased, because he could inoculate with it in smallpox and syphilis without infecting the subject; whereas, if he made use of lymph, he produced the disease. This is no proof, however, that the blood contains no morbid matter; for the poison mixed with it may be, as we now know it to be, in too diluted a state to take

* This account is taken from Mr. Blaine, op. cit., p. 218.

any effect, though, in the purulent discharge, it appears to exist in a concentrated form. On the same principle, a person may drink a teacupful out of a pailful of water containing a certain quantity of arsenic, with impunity ; but, should he take a quart or a gallon of the same fluid, he may probably experience from it deleterious effects. Aloes itself is a poison exhibited in large doses. Another proof of the blood being diseased, is, that syphilitic infection will frequently create disease in the throat : how could the poison get there but through the medium of absorption and circulation ? Be this explicable however as it may, we have proved the fact beyond all doubt and dispute by the test of direct experiment. ”

“ Glanders is not so prevalent in the summer as in the winter season ; and it has, in several instances, been known to be epizootic, particularly when horses brought from camp or other external situations have been returned into warm and unventilated quarters. If precautions were taken to properly ventilate stables, the disease might be altogether eradicated. In further proof of the disease originating without contagion, we have instances of glanders breaking out among horses that have been embarked in a perfectly healthy condition on board of ships entirely new. In the expedition to Quiberon, the horses had not been long on board of the transports before it became necessary to shut down the hatchways : the consequences of this were, that the horses were almost suffocated with heat, and that almost all of them disembarked either glandered or farcied. The malady which broke out among the men engaged in the Walcheren expedition attacked almost all of them, hence it was considered to be a contagious disease ; afterwards, however, it proved not to be, nor was this assumption required to explain its endemic character, for they all (if the expression may be allowed) ate it, they all drank it, and they all breathed it. It is for want of reflection upon these points that people are so often differing about the contagious and non-contagious nature of diseases. It has been observed, that glanders is mostly present where grease is prevalent ; indeed, this fact led SAINBEL to say, that grease was a cause of glanders : but, in truth, it is no more a cause than dung and urine are causes ; it is simply operating as another cause of atmospherical impurity.

Under such circumstances, the fetor of grease will predominate, as the stench of a goat will, after the effluvia arising from the excretions and secretions; and it was the observance of this fact probably that gave origin to the vulgar notion of the salutary influence of goats kept in stables."

"The acute glanders is the same disease, in regard to the nature of the poison, as farcy and chronic glanders; I am, however, not so confirmed in my own opinion concerning the affinity of the last as in respect to farcy. Acute glanders hardly ever proves fatal without farcy making its appearance before death; on the other hand, farcy rarely or never of itself puts an end to life, it being superseded commonly by acute, sometimes by chronic glanders. Independently, however, of these practical observations, we have shown their essential identity by direct experiment: we have produced farcy by inoculation with the poison of acute glanders, and acute glanders by inoculation with the matter of farcy: we do not always succeed, it is true, but one case proves as much as a thousand."

"CHRONIC GLANDERS commonly affects but one side of the head: if, therefore, a discharge makes its appearance from one nostril alone, that of itself is strong presumptive evidence of the presence of this disease. This partial flux cannot come from the lungs; for, if it did, the other nostril would discharge too:* it must have its issue from some part anterior to the larynx; consequently it can have no other source but the membrane of the nose or that portion of it lining the sinuses. Should it come from the nose, the membrane, most likely, will have a redder aspect upon that side of the septum than upon the opposite, or there may be a disposition to, or actual ulceration. If the nasal discharge is considerable, and, at the same time, the animal to all appearance continues in the enjoyment of good constitutional health, such circumstances should serve to strengthen your suspicions. People cannot conceive how it is a horse can have glanders so long as he eats and drinks, and does his work in perfect health; this very fact, however, I repeat, is corroborative of an unfavorable prognosis. Another circumstance to be attended to is, that the nasal flux has little

* See my remark concerning this at page 179.

or no fetor ; offensiveness of breath is pretty certain evidence that glanders is not present : not but what pneumonia and glanders may exist in the same subject, but, fetid breath commonly proceeding from the lungs, and this chronic discharge coming from the sinuses of the head, the one disease is not in any way necessarily connected with the other. In glanders, the nostrils are contracted and gummed with inspissated discharge ; but the flux is not offensive, or, at least, to the same degree as pulmonary fetor is. Again ; in glanders, generally speaking, there is, on the same side from which the discharge comes, a defined swelling of the submaxillary glands, which is attached closely and immovably to the side of the jaw : if it is a tumour of considerable size, one that is diffused and extends inwardly, or one that is very moveable under the fingers, most likely it is not lymphatic, and therefore not connected with this disease. So far as my observation has gone, no such glandular swelling happens in common inflammation."

" In chronic glanders, then, the general health, appetite, spirits, &c., remain unimpaired. There is simply a discharge from one nostril, accompanied by fetor, with a circumscribed immovable tumour under the jaw on the same side. In some cases, however, the flux comes from both nostrils : here, commonly, both sets of glands are tumefied, the nature of which swellings will serve to direct the diagnosis ; in addition to which, most probably, the animal's health continues good, and the discharge is not offensive. But, if cough be present with such a discharge, the submaxillary tumefaction uniformly diffused between the sides of the jaw, and there are feverish symptoms and evident impairment of the general health, the lungs in this case are probably the seat of disease. Still, in order that we may be certain about the existence of chronic glanders, we have no occasion to implicitly rely even upon these signs, for we may at once decide the point by the test of practical investigation. We have only to perforate (with a spill-gimlet) the frontal sinuses, and inject some clean tepid water into them : should the sinuses be healthy interiorly, the fluid will run from the nose either limpid as it was thrown in, or merely be tinged with blood ; whereas, in a case of disease there, the water will carry down with it the matter lodged in

the cavities. It is not uncommon, in chronic glanders, to observe a horse discharging profusely for several days, and then suddenly to cease running altogether. This arises either from inspissation of the matter collected, or from the effusion of adhesive matter within the sinus, which settles at the bottom of the cavity, and plugs up the aperture by which it communicates with the chamber of the nose. During the interval of suspension no sign of disease remains but the submaxillary tumefaction; there is no discharge, and consequently there can be no source of contagion; but, the collection of matter continually augmenting, at length the plug is forced out, and the flux returns with more virulence than ever. In Smithfield, it used to be a common cheat to sell a horse having this disease for a sound one; the trick consisting in stopping up the nostril of the affected side with a piece of sponge, which, of course, received and imbibed the discharge."

"Though we have no specific remedy for chronic glanders, no more than we have for acute, the Professor has seen more cases of recovery from this than from the latter disease. When the discharge early in this affection becomes profuse, and continues long so, it will end, every now and then, in a spontaneous cure, as is the case so often with gonorrhœa; at other times, the flux will persist and run for years, and the horse, so long as the disease continues chronic, maintain his full health. Many horses of this description are to be found in various parts of the country working in road-wagons, brick-carts, farmers' establishments, &c. Notwithstanding that, the disease is not only incurable, but is contagious. The matter emitted from the nose of a horse having chronic glanders has the property of propagating, through contact, either acute or chronic glanders, or even both."

FERON, 1803, in discarding the notions of Lafosse, gives a very imperfect outline of such as were entertained, in his day, by Coleman. He tells us, "the disorder may be divided into two states, the one chronic, and the other acute. The first is easily distinguished from the other, as the running at the nose is but trifling, and of a very transparent colour, and no ulcers at the nose are yet observable; whilst in the second case, or in the acute stage, the running and the ulcers in the nose have

a very offensive smell," &c. The *earliest* stage of the disease "I call *chronic*."*

SHIPP, 1808, among his 'Cases in Farriery' relates but one of glanders; and that occurred in a horse "belonging to a glazier of Doncaster;" from which solitary instance we are led to infer, either that glanders was unknown in his own regiments, or that he had kept no records of any military occurrences of the kind. The case itself is only worthy of mention as showing the author's belief that the horse "might live *many years* with the disease, and in that time contaminate a great number of (other) *good* horses," &c.†

PEALL, the Irish veterinary Professor, 1814, imbibing the more correct pathological views of glanders and farcy which had been formed by Coleman, surprises us when we find him saying, that, "in a practical point of view, it is not very material to inquire whether the farcy and glanders (which he regarded as the same disease) originate *in the arterial or the lymphatic system*!"‡

SMITH, Veterinary Surgeon to the 2d Dragoon Guards, published in 1818 the results of his observations, in his regiment, on glanders,§ which, as we have already seen, are chiefly interesting to us on account of the pertinacity with which he, on the strength of the facts and cases he adduces, argues the great improbability and irreconcilableness of the doctrine of the spread of glanders through contagion. He places glanders "either in the nasal, frontal, or maxillary sinuses; as a discharge from the lungs, trachea, or fauces, through the nostrils, does not constitute a real case of glanders."—Although "it frequently happens that only one of the nostrils, or one of the frontal sinuses, is diseased;" Mr.

* 'A New System of Farriery,' by John Feron, veterinary Surgeon 13th Light Dragoons. 1803.

† 'Cases in Farriery,' by John Shipp, Veterinary Surgeon 23d Light Dragoons. 1808.

‡ 'Observations on the Diseases of the Horse,' by Thos. Peall, Veterinary Professor to the Dublin Society, &c. Cork, 1814.

§ 'The Horse Owner's Guide; containing Valuable Information on the Management and Cure of Diseases incident to Horses; more particularly that very fatal Disease called Glanders,' by Thos. Smith, late Veterinary Surgeon 2d Dragoon Guards.

Smith has never seen either of the maxillary sinuses diseased unless the frontal sinuses were also affected." Mr. Smith, like Professor Coleman, regards glanders as "inflammation, increased secretion, and ulceration of the mucous membrane lining the nostrils and the other cavities of the head." He has seen but "eight cases in which death was occasioned by suffocation."—"In several cases he has seen the mucous membrane ulcerated, and the bones affected, without any enlargement between the maxillary bones." He feels it "scarcely possible" from the "various shapes" glanders assumes, to give such an account as will "enable a person who has not been in the habit of investigating the symptoms, to determine with certainty whether a horse be really glandered or not:" he has "seen many horses pronounced glandered where no indication of the disease could be found to exist in the head after death."—Following Coleman, he reckons but "two species of glanders,—*acute* and *chronic*." "The acute disease is situated in the *nasal sinuses*, and is frequently a primary disease, as well as a sequel of other diseases previously existing in the system, particularly *farcy*, which has probably occasioned them to have been mistaken for the same disorder. But, notwithstanding they are produced by the same cause, and appear in the same subject, *they are nevertheless distinct diseases, having no other affinity than there is between a primary and a secondary disease*." Mr. Smith has "seen glanders without farcy produced by diseased liver"—and "both farcy and glanders are the consequence of diseased mesentery"—also farcy by itself and glanders by itself from the same. "When glanders is a concomitant of farcy, it is generally in consequence of that disease having extended to the mesentery;"—this membrane "falls into decay, and then glanders appears, generally a few days before death; not because it is the same disease, but because the nostrils, being an extreme part, and their living power diminished, the mucous membrane becomes susceptible of inflammation, which is probably excited and increased by the ingress and egress of the air in respiration," &c. Mr. Smith has "never seen death occasioned by the acute glanders, except by suffocation or *hæmorrhage*. If it was a constitutional disease, would it not

affect the system, and produce death in a variety of other shapes? In the chronic state, glanders does not produce any other disease in the system"—“nor occasion death, *except by destroying the orbitary processes of the os frontis, and affecting the brain.* In one subject he has “seen death occasioned by a morbid affection of the brain.” In another, “matter compressing that organ so as to occasion lethargy.”

AYGALENQ, a French physician, in a pamphlet, published in 1809, entitled, ‘*Aperçu Général sur la Perfectibilité de la Médecine Vétérinaire,*’ in proposing to adopt names derived from human medicine for our veterinary ones in ordinary use, suggested for glanders that of “*affection contagieuse du système lymphatique;*” plainly showing from this what his views were in regard to the pathology of glanders.

DUPUY, 1817, whose celebrated work on TUBERCULOUS DISEASE, commonly called *glanders, consumption, strangles, farcy, &c.*, I was the first to introduce to the notice of my brother veterinarians in this country, occupies one of the highest stations in our present historical catalogue, as being the author of an entirely new doctrine on the pathology of glanders, farcy, &c. Holding in little estimation the opinions of his predecessors; looking upon them as altogether insufficient to account for the phenomena exhibited in glanders and farcy, and resolved, if possible, to discover “the source of the evil,” he traced the origin of both these diseases, as well as that of several others, not of horses only, but of dogs, cats, monkeys, and domestic fowls as well, to the existence and development of *tubercle* in some part or other of the body, and, accordingly, he ranged all these several disorders of the animals mentioned under the generic appellation of “TUBERCULOUS AFFECTION.”

“Tubercles, which appear as little, firm, grey, hard bodies, are organic productions, originating from causes unknown, existing at first in small numbers, and interfering but little with the functions of the parts generating them. In this, their incipient state, the animal enjoys perfect health, and continues in the preservation of it up to the period of the disorganization of the tubercle, those changes in its interior which end in its mortification and ulceration. In time, they increase in number, and the result is a discharge commonly from one nostril, which, at

its commencement, is regarded as *catarrh* or *strangles*. This stage may occupy a term of five or six years.* In the second stage the tubercles grow soft, break and become converted into ulcers. There are varieties of tubercles; the most common are the *miliary*; and these are the precursors of that species of ulceration which I have described (at page 169) as resembling worm-eaten wood. They are found in greatest numbers in the course of the large veins upon the septum. They are also found within the duplicature of the *ala nasi*, and upon the turbinated bones, pursuing the course of the large blood-vessels. They may even exist within the substance of the cartilage of the septum, and thus assist in its destruction. The membrane lining the sinuses is rarely found tuberculated. Tubercles have, however, been observed in the lungs, lymphatic glands, cellular membrane, skin, testicles, lining membrane of the alimentary canal, &c. Should glanders be complicated with a tuberculous affection of the lungs, the animal coughs frequently, tires soon, perspires readily: latterly he loses his vigour and energy, becomes washy, soft, and lazy; subject to catarrh, ophthalmia, cutaneous eruptions, farcy, œdema, &c. And now, soon glanders becomes complicated with farcy. *Farcy buds are nothing else but scrofulous tubercles*; they grow, develop, and decline, the same as pulmonary tubercles. *Glanders bears, therefore, the closest analogy to phthisis in man*. The phthisis of the pituitary membrane will sometimes turn of a cancerous nature; at other times it has been known to become typhoid."

FARCY, Dupuy regards as the same "tubercular affection" as glanders, notwithstanding it is "often *local* and an *original* affection;" and on this account "it admits of being cured, while glanders has resisted every remedial means hitherto used." When we find one veterinarian declaring farcy to be curable, another incurable, "the probability is, they have been treating different varieties of the same disease: in one case the farcy may have been *local*, in the other *constitutional*."

OF THE PULMONARY TUBERCLE, Dupuy has observed "three varieties, the *miliary*, the *pisiform*, and the *unciform*. Each tubercle is composed of an envelope or cyst, and of a whitish

* Dupuy cannot exactly say how long: once developed, however, resolution is hopeless.

substance easily crushed between the fingers, which Messrs. Dulong and Labillardière have found to resemble osseous matter. Very considerable depositions of this bony substance are occasionally seen in the proper pulmonary tissue, especially in the ox species. When the tubercles are of the large kind their number is limited; but the *miliary* species are innumerable. While forming, they are firm, organized, and *always found in the course of the blood-vessels*, whose calibre is singularly augmented. They grow and become developed like any other organized bodies, without our being able to offer any rationale of the process, or of the space of time they continue organic prior to their mollification and degeneration. They commonly end in ulceration and destruction of the pulmonary tissue. The lungs present *vomicæ* or cysts of various sizes containing thick reddish matter, or else a more liquid cheese-like matter."

Dupuy has likewise discovered miliary tubercles within the parenchyma of the liver and kidney; but much oftener than in either of these bodies, within the testicles. Even the epididymis has contained them.

Dupuy agrees with Gilbert in regarding strangles as so far "identical in its nature with glanders;"—"that strangles and bastard-strangles, as well as farcy, grease, and ophthalmia, are frequently the results of one and the same specific cause;" that cause being "the tuberculous affection."—"Glanders itself," he adds, "*is a specific disease*, and not a termination of strangles, bastard-strangles, cynanche maligna, farcy, watery farcy, catarrh, &c. When the lungs are affected, *it is a sequel of the tuberculous disposition*, and not a termination of pneumonia. On the contrary, pneumonic affections are very often consequences of the tuberculous affection." And in another place—"observation has shown that puriform matter coming from the bronchiæ, which is discharged by the nose, *does not cause glanders in passing over the nasal membrane*, as veterinarians have imagined."

Dupuy informs us that glanders may exist in that "latent" form, that it may not by the most acute observation be discoverable during life. "Tubercles will exist, not merely in the first, but even in the second degree of development in the internal viscera, without deranging their functions, and particularly in the lungs." Or the disease may, after having made its appear-

ance, subside for a time, and afterwards re-appear, without any ostensible reasons.

Speaking of what in France is called *acute glanders*, Dupuy tells us "it is a disease of another order. *It must not be confounded with the tuberculous affection* ; rather, it has analogies with the typhus of cattle or with the great epizootics which at different periods have ravaged France and Europe."—"All I am desirous," adds Dupuy, "of impressing, is, that *this disease cannot be considered as glanders*." It is consequently one concerning which, for the present at least, we need take no account.*

MOREL, 1823, denies the specificity of glanders, regarding the disease as no more than the natural consequence of chronic inflammation of the mucous lining of the aërial passages.†

GERARD, 1827, asserts the identity of glanders and farcy. "Glanders," he says, "is no more than *farcy in the nose*. And the farcy-buds and pimples observable upon the pituitary membrane constitute lesions of the same description, in both instances succeeded by ulceration."‡

RODET, 1830, the Veterinary Professor at Toulouse, adopted the Dupuy theory, but with such important modifications as gave it a more regular and systematic form. Admitting tubercles to constitute the especial and proximate cause of glanders, he—not leaving us, as Dupuy has, in doubt—ascribes their origin to a constitutional influence, dependent upon a lymphatic temperament, vicious conformation, hereditary disposition, or upon accidental causes, such as the relapse and chronic prolongation of diseases at first acute and of a different nature ; from which it follows that glanders may be either constitutional or acquired. The former will be primitive or secondary, according as the tuberculous affection has its seat exclusively or at least originally in the pituitary, or as that membrane becomes affected through extension of the disease from the lungs ; the latter—or acquired disease—will be the result and producer of phlegmasial irritations, repeated or more or less protracted, sometimes in the pituitary alone, but oftener, if not always, in the mucous

* Op. cit., page 204.

† 'Traité Raisonné de la Morve,' 1813.

‡ 'Remarques et Observations sur l'Identité de la Morve et du Farcin.' Recueil de Méd. Vét., tom. iv, p. 269. 1827.

membrane lining the air-passages, a circumstance which, at the time that the degeneration (of tubercles) exists nowhere but in the nose, goes far to show that glanders is an affection purely consecutive to these same irritations.”—In fine, according to Rodet, glanders is no more than a symptomatic disorder—“a morbid state ever consequent upon other disease.” *

BENARD, in some researches he made into the nature of the blood in glandered horses, discovered albumen to be predominant in it according to the length of time the disease had existed, and that any amelioration that took place of the patient under its influence was attended by a correspondent diminution of the quantity of albumen. In some horses virulently glandered, albumen constituted seven eighths of the mass of blood. And this excess of albumen in the blood, Benard ascribes rather to disease of those excretories of the body which give issue to albuminous secretions, than to irritation or modification of the vitality of organs whose function it is to renovate the circulating fluid.†

BARTHELEMY, in discussion before the Royal Academy of Medicine, wished to be understood that he had never pronounced glanders to be a *local* disease. Acute glanders cannot be considered as a local affection, from the circumstance of its being accompanied by an eruption all over the body: it is a *constitutional* malady, whose principal, essential, characteristic effects show themselves in the nasal cavities. Nevertheless, some facts lead him to believe that the particular affection denominated *chronic glanders* is a local disease.†

DELAFOND thinks that glanders is often bred in the system. So far from imagining that the disease originates *always* in the pituitary membrane, he affirms that in an immense majority of cases its seat is *in the lymphatic system*; and that its nature consists in an alteration, about which we know little, of the *lymph* as well as of the vessels conveying it.†

HURTREL D'ARBOVAL sums up the ancient as well as modern doctrines on glanders, and concludes his interesting summary with his own notions on the subject:—“Lafosse appears to us to have been the first to have hit upon the true seat of glanders.

* Op. cit., page 215.

† ‘D’Arboval’s Dictionary,’ article “Morve.”

In showing glanders to be a local malady, confined to the cavities of the nose, to the sinuses connected with it, and to other parts of the nasal membrane, he has established a fact which to us appears indisputable, one that is actually admitted—as, indeed, it ought to be—by all candid persons, by all such as make it their rule to found their medical observations upon pathological anatomy and physiology.”—“ If we have been thus fortunate in our discovery of the true seat of glanders, it only remains for us to agree concerning its nature. To how many hypotheses, founded upon analogies more or less erroneous, has not this point given origin? and what are we to think about a disease whose nature has given rise to so much diversity of opinion? Let us leave to the accurate observations of minds unbiassed and guided by truth alone the important task of discovering and unveiling to us the veritable, the intimate nature of glanders; and, while these researches are making, forming our opinion from such phenomena as are already within our knowledge, let us be content with viewing the disease as *a specific inflammation of the pituitary membrane*; *acute* in its *incipient* stage, however short that stage may be—*chronic* in its other stages, possibly so from the beginning; and, like every other *phlegmasia*, susceptible of re-acting upon other organs with which they are connected through sympathy, through reciprocity of relation connecting one with the other, and rendering them reciprocally dependent one upon the other. In the actual state of our knowledge we must not expect to be able to explain what we mean by the inflammation being *specific*; in what it differs from other inflammations of the same tissue; why it should be contagious and hitherto prove incurable; why, as it resembles catarrh at its outset, it does not terminate in the same manner, but, on the contrary, assumes specific characters, distinguishing it from *coryza*, *angina*, and what is called *strangles*. When we shall have thoroughly examined and probed this question, when we shall have sufficiently studied all the points bearing upon its unravelment, perhaps we shall find fewer difficulties standing in the way of its solution;—perhaps we shall discover that glanders does not differ so much as we had imagined from *coryza*,—perhaps we shall find out that it is nothing more than a modification of *coryza*. It may be, that glanders

differs from nasal catarrh in nothing beyond its being obstinate and tardy in its progress; that it is analogous to an habitual and chronic coryza—or nasal gleet—which may, the same as glanders, entail serious consequences; may be, in spreading by degrees to the lungs; may be, in giving rise to ulcerations and excrescences upon the pituitary membrane. Besides, do we not know that, in highly acute coryza, the nasal discharge, especially while it continues clear and limpid, is acrid to that degree that it irritates and even excoriates the skin, clothing the doubling of the nostrils over which it flows? The facility with which horses, standing together in the same stable, *catch the same catarrhal disorder*, might lead us to presume that the discharges, at least up to a certain period, harboured some contagious property. After all, these are but hints that we have thrown out; and so far are we ourselves from regarding them as infallible, that now we are going to offer some further considerations apparently of a contradictory character.”

“Nevertheless, before we conclude, we shall frankly give our own opinion on the subject. According to our notions, *glanders is a disease of the pituitary membrane*—an abnormal secretory irritation of it—either arising spontaneously or caused by contagion. The idiopathic disease may be primitive or consecutive to the internal change, be it of the entire economy or of one of the principal systems, especially the respiratory. As for the different forms or modifications under which glanders appears, *chronic and acute, pustulous and ulcerative, ecchymotic and gangrenous*, these are but phases of endless variety, consequent on the conditions of individuals and on extrinsic causes.”*

PROFESSOR SEWELL’S opinions on glanders—as they stood at least so far back as the year 1827-8—will be found in an Introductory Lecture delivered by him for that sessional year, at the Royal Veterinary College; which was by myself taken down in short hand, and afterwards published in the first volume of THE VETERINARIAN. I here transcribe them, with some slight alterations of wording and arrangement: †—

* Op. cit., at page 217.

† In reply to a letter I wrote to the Professor in March, 1844, submitting to him the statement I now introduce here, and requesting to be informed if this coincided with his present views, I received for answer—“that he (the Professor)

The Professor believes the *lungs* to be the *original seat* of glanders, and the affection of the nose to be *secondary*. He agrees with Dupuy in thinking that *miliary tubercles constitute the original disease*; and that these suppurate, and by coalescence form considerable abscesses in the lungs, the contents of which become discharged through the nose, and thus constitute glanders. *In the early stage*, even in this (tuberculous) condition of lung, Professor Sewell believes that many horses are *recoverable*. He has ascertained that matter taken from these suppurated tubercles (*vomicæ*) will by inoculation produce glanders as surely as one (planted) potato will produce another. Asses inoculated with such matter have had tubercles produced in their lungs *in the space of five days*; and what renders this experiment more satisfactory is, the fact of asses *rarely* having (from other causes) tubercles in their lungs.

YOUATT regards glanders as “inflammation of the Schueiderian membrane, *strictly local for awhile*, and during its insidious state; and even when the discharge becomes gluey, and some time after chancres have appeared, the horse is apparently well.”—“I cannot say,” continues Mr. Youatt, “that glanders, like the rot, improves the condition; but I have seen that often, and for a long while, for months and even for years—it does no injury to the general health. The inflammation is purely local, and is only recognised by that invariable accompaniment of inflammation,—increased secretion. Although that secretion is poisonous, and its neighbours fall victims to it, it affects not the animal whence it came. But this continued inflammation at length tells, or other circumstances increase its power and its effect, and the vitality of the tissue is destroyed and suppuration succeeds; but not that of a healthy character—not that which is connected with reproduction;—it is malignant and destructive from the beginning; and soon another process commences, salutary or destructive, according to circumstances. There are absorbents on every surface; they are found on the surface of the chancres which are beginning to appear; and they take up the fluid which is secreted from the ulcers, and they soon feel its poisonous influence. The absorbents become inflamed and tumid; and,

is confirmed by time and experience in his opinions and views which he expressed on the subject of glanders in his ‘Introductory Lecture’ for 1827-8.”

where the virus rests, as it were, viz. at the valves, destruction of the part ensues, and the chancres spread in every direction.” —“Some portion of the venom passes on, and is carried into the circulation and mixes with the blood, and vitiates the blood.” —“Then comes the constitutional affection. The membranes of the neighbourhood, and those most susceptible of irritation, first yield. Chancres proceed down the pharynx and larynx, and gradually the ulcers spread over the frame. The acrimonious fluid, mingling with the blood everywhere, begins everywhere to attack that tissue which is most susceptible of its influence, viz. the lining membrane of the absorbents; and by degrees, and in most distant parts of the frame—the hind extremities are a favorite situation—the absorbents become chorded, and tumours appear in the situation of the valves, and ulcerations ensue. First, the superficial absorbents are affected; then the deeper-seated become involved: the whole frame is poisoned; farcy is established in its most horrible form, and death speedily closes the scene.”*

VINES, 1833, deserves the thanks of the profession for the pains he has taken in the practical investigation of a subject, some of the main doctrines concerning which he has had the boldness to question the validity of, and in their place has introduced others, if not altogether novel in their character, at least, original in this country; which I shall, by quotation, endeavour to put my reader fully in the possession of. That opinion on which Coleman and his followers grounded their theory of the nature of glanders—the existence of *a poison in the blood* of glandered and farcied horses—Mr. Vines denounces as “great error” (p. 2): he believes neither in *specific disease*, nor in *specific poison*, nor in *specific effects*. “All the symptoms of disease which constitute glanders and farcy,” he avers, “invariably depend upon *the unhealthy state of the system*, into which it is reduced or brought, and not, as is generally supposed, from (upon?) *a specific poison* contained in the blood” (p. 2). —“In common inflammatory diseases, the system is always in a more or less healthy state; but, on the contrary, when those symptoms of disease which constitute glanders or farcy occur, the system is always in a more or less unhealthy state; and in proof of this I may advance, that the diseases of a common

* Mr. Youatt's Veterinary Lectures in 'The Veterinarian' for 1832.

inflammatory nature, such as *strangles*, *colds*, *inflammation of the lungs*, *grease*, *injuries*, &c., from neglect or improper treatment, frequently degenerate into what is commonly termed glanders or farcy" (pp. 6-7): so that—putting *poison* and *specification* altogether out of the question—glanders and farcy are nothing more than "unhealthy disease" of the mucous membrane which lines the nose, the substance of the lungs, the skin, and the cellular membrane underneath" (p. 4). This constitutes the groundwork of Mr. Vines' doctrine.—On the subject of *pulmonary glanders*, Mr. Vines assures us that "there are cases, both of glanders and farcy, where no alteration or disorganization of these parts (the lungs), or any disease of the lungs, are to be found" (p. 11).—"Glanders and farcy have hitherto been most commonly described and treated as distinct and separate diseases; whereas they are, if properly considered, *only the unhealthy and, not infrequently, the latter stages of common inflammatory diseases of certain parts of the body, generally of the mucous membrane of the nostrils, cellular tissue, or substance of the lungs, the skin, or the connecting cellular membrane underneath*; and the inflammatory diseases which glanders and farcy most frequently follow are those termed *strangles*, *true and false*; *common colds*, *distemper*; *acute and sub-acute inflammation of the lungs*; *general or local dropsy (anasarca or œdema)*; and the latter, whether it occurs from general or local debility, conjointly with *grease*, or *injuries* of different parts of the body or not; as, for instance, when a horse has been for a time labouring under one or other of these common inflammatory diseases, from the effect of which, or by improper treatment, the system has been brought into an unhealthy state. When such changes as these take place, and the discharge and ulcerations become unhealthy, the disease with which the animal was before afflicted is now altered from its original character; and, under these circumstances, the animal is usually considered to have become *glandered* or *farciéd*. Glanders and farcy not only follow such diseases as have been just mentioned, but also appear sometimes *in unhealthy and debilitated animals from over-exertion and other causes*, and without being preceded by any of the former-named diseases of a common inflammatory character: *and this is occasioned by the*

system being reduced to an unhealthy state, from the same causes as those which, in more healthy and vigorous animals, would be found to produce strangles, common colds, inflammation of the lungs," &c. (pp. 12-13). In cases of glanders following colds, &c., Mr. Vines does not consider them, strictly speaking, as glanders, "until the discharge or matter from the nostrils is capable of producing similar effects," &c. (p. 167). Mr. Vines makes a division of glanders according as it is confined to the head, or as the head and lungs are both diseased:—"In order to enable those who may be disposed the better to comprehend the subject, I shall divide the symptoms which constitute glanders into two classes, beginning with those which are confined to the head." Here follows "Sect. I," treating of "Glanders when confined to the mucous membrane lining the nose and cavities of the head;" and, "Sect. II," "Glanders, when the head and lungs are both diseased." The treatment for glanders and farcy recommended by Mr. Vines I shall defer the account of until we come to consider that branch of our subject.

BLAINE has always "felt convinced of the *specific nature* of this affection (glanders), which, for variety in its mode of production, continuation, and termination, has no parallel; and to which only we can attribute the unsettled state of the opinions concerning it, but which do nothing to unsettle its claim to the character of a *direct and peculiar poison* which can always beget its like, and its like only. If the matter of farcy and the matter of glanders could produce at one time grease or strangles, and at another mild catarrh, I might doubt," says Mr. Blaine; "but when I find nothing but the same type of disease follow from the infection, I can only consider such an infection as one *sui generis*."*

SPOONER, 1812, the able Editor of White,† has, in one of

* Op. cit., at page 218.

† At page 200 I have quoted from the *seventh* edition of White's 'Treatise on Veterinary Medicine;' nor did I know, until Mr. Spooner's reconstructed work came into my hands, that there had been a sixteenth edition. And at page 236 I have named White as authority for glanderous matter having been administered to horses in the form of bolus *without effect*. Now, however, that I have Mr. Spooner's edition before me, I can—and must in justice to the

his interpolatory paragraphs, favoured us with his own opinions on the nature of glanders. "These views (Dupuy's) are deserving of great weight, but we cannot altogether coincide with them; for, although perhaps in the majority of cases tubercles are found in the lungs of glandered horses, yet there are instances in which there are none to be found there or elsewhere. The particular seat of glanders is certainly *the membrane lining the nostrils and chambers of the head*, although in a great number of cases the lungs are involved. We cannot say whether in all cases the constitution is affected, or whether in some instances the disease is entirely local; but, in the subject chosen by Professor Coleman for experiment, it was clearly proved that the blood was infected. There is evidently a much greater predisposition in some horses to receive the disease, either from infection or otherwise," &c.*

TARDIEU,† bringing our literary history up to 1843, has made a systematic arrangement of the several important questions touching glanders and farcy, and with considerable clearness and ability has respectively examined them:—

1st. He considers the identity of glanders and farcy, in respect to their production—to their being allied by the same specific virus—as a point settled; but, he asks, are we thence to conclude, as other writers have done, that their *pathology* is identical? This grave question, involving no less than the knowledge of the *nature* of glanders and farcy, he confesses himself unable to decide, further than that the diseases differ in their nosological characters.

2d. Glanders he regards as essentially consisting in *lesion* of

original author—correct myself. "Glanders," in this edition, White tells us, "is a contagious disorder, which is communicated by inoculation, and *by swallowing matter*, and not by effluvia proceeding from a glandered horse, or a stable in which a glandered horse has been kept." And in another place, "I am inclined to believe that the disorder is more readily caught *by eating the gland-erous matter* mixed with the oats and hay than by drinking it with the water," &c.—White, edited by Spooner, 1842.

White's 'Compendium of the Veterinary Art,' edited by W. C. Spooner, V.S., &c., 1842.

* 'De la Morve et du Farcin Chroniques, chez l'Homme et chez les Solipèdes.' Par Ambroise Tardieu, Docteur en Médecine, 1843.

the nasal fossæ; all cases not showing this belong to farcy; and this applies to men as well as to solipedes.

3d. That farcy, in the chronic stage, may present different phenomena in men and animals without losing their specific relation to each other. These constitute his "*Considérations Préliminaires.*" The work itself is devoted to the consideration of what he denominates "chronic" farcy and glanders in man.

Few histories of disease, perhaps, carry with them more interest than the one which, by extracts from authors, writers, and lecturers on the subject, we have just finished tracing, from the earliest records down even to the present period. The primeval notion was, that the nasal discharges came from the brain—nay, consisted even of the cerebral matter itself running away through the nostrils: and considering how white and curdly (brain-like) the nasal fluxes in chronic glanders often are, the idea was not, in the times in which it was conceived, so very romantic a one. Succeeding writers located the disease in some of the viscera—in the liver, the spleen, the lungs, &c.; and in later times it was, in accordance with the humoral pathology in vogue in those days, said to be in the blood.

To Lafosse the veterinary world most assuredly is indebted for the discovery of the true seat of glanders. And, considering the good health horses for a time enjoy with the disease, together with the fact that many that die of it exhibit disease in no other part save in the head, and that his injections did on occasions, no doubt, suspend, if not *cure*, fluxes from the nose, it is no matter of surprise to us that Lafosse pronounced glanders to be a *local* disease, one confined to the membrane lining the nose. Neither ought we to marvel that Lafosse's doctrine should have become so universally received and adopted as it was, not in France alone, but in England as well, and by veterinarians of the greatest repute too, by (among others) St. Bel, the first Professor of the London Veterinary College, seeing that it had already received the stamp of approbation of the Royal Academy of Medicine at Paris. And in order to perpetuate so valuable a discovery—for it really was a valuable one, and especially when compared with the notions entertained

concerning the seat of glanders antecedently to Lafosse's time—Lafosse's son exerted all his energy in defence of it, against any attacks on the part of those who had the boldness to call its truth into question. Indeed, at the present day even, we have only to give a little more scope to Lafosse's definition still to confirm its truth, and say, that

THE SEAT OF GLANDERS—instead of being confined to *the pituitary membrane*—is in THE AERIAL MEMBRANE;* that membrane with which the respired air comes into contact, and which constitutes the lining of the nose, of the sinuses of the head, of the windpipe and its ramifications. Dupuy, in investigating the seat of the tuberculous affection, so far as he found it corresponded to our glanders, came to the conclusion, that, commonly, the disease attacked, *primarily*, “the mucous membrane lining the frontal, maxillary, and other sinuses;” secondly, and next most frequently, “the membrane lining the chambers of the nose;” thirdly, “the lungs.” Rodet, the adopter and expounder of Dupuy's doctrines, tells us that the pituitary or Schneiderian membrane may become *secondarily* affected, “through extension of the disease from the lungs.”

THE EARLIEST INTIMATION we receive of disease in the aërial membrane consists in discharge from the nose, which may either be speedily followed by ulceration, or may continue for an indefinite length of time with but trifling alterations of it either in quality or quantity. Of the primary morbid changes in the membrane—unless the disease should happen to attack the part covering the septum nasi—we can obtain no information: injection of its vessels, amounting or not to inflammation, may exist hours, or even days, before any running from the nose appears of that quantity or quality to attract notice: the submaxillary gland in the meanwhile becoming swollen or not, according to the amount of local irritation present. The case at the beginning will assume that insidious or indefinite form that it may, and particularly when no suspicion lurks in the mind of the examiner, be mistaken for catarrh, the inflammatory or augmented vascular action in the membrane, of the

* This appellation is preferred on account of its comprehensiveness. Had we said *the membrane lining the air-passages*, the sinuses of the head *might* appear not to have been included,

frontal and other sinuses, proceeding all the while, converting the natural scanty mucous secretion into a copious and morbid or malignant one, and increasing through infiltration and interstitial deposit materially the thickness or substance of the membrane. These are the primary, in some instances the only, changes the aërial membrane undergoes in glanders; and though they are alterations which would take place from any common irritation and inflammation, still, in the case of glanders, they must be regarded as *specific* ones, from the circumstances of the discharges (from the nose) being found capable, through inoculation, of engendering similar disease in another (equine or human) animal. Vascular injection and thickening are succeeded by the appearance of pimply or tubercular elevations upon the surface of the membrane; and these, as we have already seen, are but the preludes of a correspondent number of ulcerations, called *chancres*, in which, for the first time, supposing them to be visible, we may distinguish characters such as are peculiar to glanderous disease; or, at all events, such as are not seen in the ulcer which we meet with on the occasion of common irritation or lesion from injury, whenever this—rare though the occurrence be—does happen to take place. And it is worthy of our especial remark, that the pimples or tubercles make their appearance in waving lines, pursuing the courses of the larger blood-vessels, the superficial veins in particular, the chancres resulting from these pustular formations preserving the same chain of connexion; though, when the latter come to spread over the surface of the membrane, these lines of concatenation are, in course, rendered much less distinguishable.

Notwithstanding every part of the aërial membrane is liable to be, and, indeed, in its turn, has been known to be, the seat of glanders, yet are certain parts of it much more frequently affected than others, and, under a state of disease, present phenomena somewhat different from what the others exhibit. Coleman's notion concerning the most frequent or especial seat of the disease corresponded with Lafosse's: he thought the membrane clothing the septum nasi was the part commonly attacked—that it possessed a peculiar or especial susceptibility to be affected by the virus or miasm. Dupuy, however, has found

the *sinuses* of the head to be the primary and most frequent place of attack; and, knowing the subacute and insidious form glanders in so many instances at its beginning assumes, we are inclined to believe Dupuy's pathology to be the correct one. Next to the head, we find the lungs taking on the disease; not by direct extension of the morbid action to them through the medium of the windpipe and its branches, but—as we suspect—from the continual inhalation of the glanderous effluvia arising from the diseased surfaces in the nasal cavities and sinuses, as well as from the malignant matters lodged within them; at the same time, the general contamination of the system not being without its influence. The lungs, however, do not prove diseased in all cases of glanders. In such subjects as exhibit the disease in its acute form, and wherein death, resulting from suffocation, is suddenly or quickly produced, the lungs—unless they might happen to have been already in a state of disease—are commonly found in a perfectly normal state. The consideration of these contingencies upon which the condition, sound or morbid, of the lungs appears to depend, will serve to reconcile the wide differences of opinion that have been promulgated concerning them: some contending that the lungs always were found diseased in glandered horses; others, that they hardly ever were, or were only so in cases in which disease had previously existed in their own structure.

Another, and by no means an infrequent, seat of glanders is the *larynx*. The glottis takes on the specific inflammation and thickening, and ultimately breaks forth in a state of ulceration, manifesting all the characters of the glanderous chancre; and, with his larynx in this condition, the horse turns roarer, though this is an effect that is not often discovered, unless the animal happens to be at the time at work. In the stable, I have never observed any great inconvenience arise from this ulcerated condition of the larynx: a circumstance, probably, the chronic or inactive nature of the ulceration will serve to account for.

I have seen ulceration within the windpipes of glandered horses; but it is an occurrence which I believe to be exceedingly rare, not within the main tube only, but within its ramifications as well. There does not appear to exist the

same susceptibility in the portion of the aërial membrane lining these tubes as in other parts of it—as even in those divisions of it constituting or lining the pulmonary air-cells.

NATURE OF GLANDERS.

OF the forty authors whose opinions I have sought on the subject, no one, to my seeming, has framed a more truth-like pathology of glanders than M. Leblanc: a French veterinarian of considerable repute in his own country, and very far from being unknown in ours. In 1839, Leblanc published at Paris a small work,* which, by accident, came into my possession a few months ago, wherein, to my great gratification, I found notions entertained such as for many a year had been floating about in my own mind; though with me they were, confessedly, rather the offspring of inductive reasoning from certain admitted facts, than of any such practical demonstration as they appear to have since received in the hands of Leblanc.

Coleman, long ago, proved beyond any reasonable ground for doubt, that glanders and farcy were identical diseases, or, rather, the same disease affecting different parts of the body; and yet—which was singular enough—he never, on any occasion that I recollect, went so far as to say that the pimple or tubercle or chancre of glanders was in reality a *farcy-bud* or a farcy-ulcer. The proofs of identity in nature between glanders and farcy rest upon—1st, their reciprocity or production through inoculation; 2dly, their traceableness to the same causes: 3dly, their termination one in the other, which almost invariably takes place, when they are suffered to run their natural course, previously to death; 4thly, their frequently simultaneous appearance in the same subject, together with the similitude of the phenomena and course they exhibit.

Assuming it, then, as proved, that farcy and glanders are in their nature but one and the same disease affecting different parts of the body, and it being admitted that farcy is a disease

* ‘Des diverses Espèces de Morve et de Farcin, considérées comme des Formes variées d’une même Affection Générale Contagieuse.’ Par U. Leblanc Médecin Vétérinaire, &c. &c. Paris, 1839.

affecting the lymphatic system, it of course follows that glanders can be no other than disease of the same system of vessels; and, supposing that this were proved, it would also follow that the pimples we see rising upon the *septum nasi* after inoculation for glanders, and on occasions in idiopathic glanders as well, and which Dupuy called and regarded as *tubercles*, would probably turn out to be nothing more than so many *farcy-buds*. With such notions as these, I repeat, impressed by such a train of reasoning upon my mind, I will leave my reader to imagine with what pleasure and satisfaction I perused the little work of Leblanc from which I am now about to make some copious extracts fully confirmatory of my own ideas, crude and undigested as they had long been, and might long have remained, for want of opportunity in my present position to put them to any sort of practical or probatory test.

SHAPE appears to have been the first veterinarian who regarded glanders and farcy as the same disease affecting different parts. He pronounced glanders to be "farcy in the head."* In the year 1827, also, a clever paper was published, "On the Identity of Glanders and Farcy,"† by Gerard, a French veterinarian, the concluding part of which runs as follows:—

"Farcy is sometimes so superficially seated, that, only the skin appearing affected, it has been regarded as a *cutaneous disease*. Considering the analogous organization existing between the skin and mucous membranes, have we not reason for believing that, if the pustules, instead of appearing upon the skin, come upon the pituitary membrane, these same pustules will then constitute glanders?"—"We have only attentively to note the symptoms, to observe the same course in glanders as in farcy. Glanderous chancres appear in cords prior to ulceration, resembling (chains of) farcy-buds. The lymphatic glands tumefy in one as in the other disease. And the puriform discharges from farcy-buds answer to the discharges from

* Vide page 260.

† At the time I perused the brief summary of Gerard's opinions, given at page 271, I was not in possession, as I now am, of the 'Journal de Médecine Vétérinaire,' containing Gerard's paper, "Sur l'Identité de la Morve et du Farcin."

the nose in glandered horses. The glanderous chancre commences in a little inflamed bud, whose summit is contracted and rounded, and filled with serosity: the pellicle covering it becoming attenuated, bursts and discloses an ulcer, which speedily acquires certain dimensions. Are not these the same phenomena that farcy-buds present?"

Turning from these accounts to the observations of Delafond—that, "in an immense majority of cases," glanders originates "in the lymphatic system," and that, in nature, it "consists of an alteration of the lymph as well as of the vessels conveying it,"*—we find the ground well prepared for laying the foundation of the pathology of glanders; and that Leblanc has achieved a great deal towards erecting a plausible and natural superstructure thereon, will, we think, appear manifest from the following extracts from his pamphlet:—

LEBLANC regards GLANDERS, whether it be *chronic* or *acute*, *pustulous* or *gangrenous*, and FARCY, be it *chronic* or *acute*, as but different forms of one and the same disease—but aggravations or ameliorations of one common or general contagious affection, having its apparent seat within the nasal fossæ or in the lymphatic system, and consisting in lesions as follows:—

IN A GENERAL ALTERATION OF THE FLUIDS OF THE BODY, in particular of the *lymphatic fluid*. This turns yellow and becomes coagulated within the canals of the lymphatics and the cavities of their glands, the tunics of the vessels thickening and turning opaque, exhibiting red points upon their inner surface, and adhering in places to the coagula within, and in other places growing more or less softened without, as yet, showing ulceration. In time, all the thickened parts of the vessel partake of this softening, spreading from a single point upon its circumference, the coagulum within softening likewise, and the cellular tissue corresponding to the point of ulceration becoming tumefied, then hardening, and lastly softening. And now a little tumour exists, having its seat, in part, in the lymphatic vessel, in part in the cellular tissue, observably close upon the situation of the lymphatic valves, which accounts for the accumulation, the lymphatic fluid in its incrassated or coagu-

* Turn back to page 272.

lated condition not being able to pass the valves.* This explains the knotted aspect of the corded swelling in farcy. When the little tumours or *farcy-buds* have the lymphatic vessels for their seat, they are not tardy in ulcerating their way to the surface through the skin. When deep seated, they grow large at the expense of the surrounding cellular tissue, which either ulcerates or sloughs, and thus contributes to the abscesses.

The fluid the softened farcy-buds contain is found pretty uniform in its character. It commonly proves a mixture of viscous fluid and coagulated matter; of infiltrated and softened cellular tissue; of purulent blood variable in its aspect, and sometimes streaked with blood. We never mind phlegmonous (laudable) pus in these small abscesses.

Farcy-buds are evidently not seated within the *principal* lymphatic vessels, and consequently, have no determinate arrangement: we find them here and there; in the greatest number, however, where lymphatic vessels most abound. At one time they are superficial, at another deep-seated. And they are found in most of the organs of the body: in the muscles, in the tendons, in the periosteum, in the skin, in the testicles, in the lymphatic glands, in the mucous membranes, even in those of the digestive passages.

On some occasions, either when the disease makes rapid progress or the alteration in the fluids proves deep-seated, farcy-buds are soft from the first formation, and burst almost immediately. And then, the buds are not confined to any region in particular, but simultaneously appear all over the body. In this case, the fluid they contain is homogeneous in its aspect, sometimes limpid, oftener livid or muddy; and this (latter) denotes deep-seated alteration of it. The blood, also, is strikingly changed.

An attempt has been made to distinguish these farcy-buds from what are called *real* farcy-buds; the former not being so considered on account of their not being found to communicate with the lymphatic vessels; the vessels not being injectible through their cavities. This, however, may arise from the extreme exility of the lymphatic vessels, or from their canals

* Coleman regarded the *valves* as insusceptible of the action of farcy.

being plugged up. What induces Leblanc to regard these isolated buds as farcinous, is the frequent appearance in farcied horses of cords and buds of different sorts at one and the same time.

In speaking of the alteration the lymphatic liquid undergoes in glandered and farcied horses, Leblanc considers it his duty to make known his opinion of the glanderous lesions that have been called *tubercles*, whether they exist upon the mucous membrane of the respiratory passages, or within the lungs, or the lymphatic glands, or any other organs.

These little tubercular bodies have received divers denominations: according to their aspect they have been distinguished into *crude*, *soft*, and *encysted tubercles*, and various have been the opinions entertained concerning their nature. According to Leblanc's (and my own) notions of them, they present an analogy in physical character to farcy-buds. Examination of the mucous membrane of the nose of a glandered horse will show, in a certain stage, that it becomes *thickened*. And that this thickening, which is owing to an accumulation of fluids of a white or whitish-yellow colour, precedes the appearance of the tubercles, the same as tumefaction of the cellular membrane precedes the formation of farcy-buds. In this (thickened) condition the membrane assumes a shiny and more humid aspect than it has in health. Then, upon divers points of its surface, and notably upon the middle part of the nasal septum and within the doubling of the nostril, make their appearance little white or yellowish-white pimples (*élévures*), rather prominent at their centres, with borders insensibly declining to a level with the surrounding membranc. *These pimples or tubercles correspond to the course of the bundles of lymphatics, and very probably have their seat in those vessels.* "At least," continues Leblanc, "I have been able to prove that little shreds (*masses élongées*), in composition absolutely like what is found within the lymphatics of a farcied limb, were enclosed within their canals, from which it was easy, with the point of the forceps (*d'un instrument*) to extract them: they proving adherent only in certain places, marked by some increase of redness.* I have found the greatest analogy between these

* We must be careful not to confound these lymphatic *coagula* with the

alterations and those which the lymphatic fluid commonly undergoes in farcy. The two sorts of pimples in the thickened membrane, after awhile, turn soft. The lymphatic substance of which they are composed becomes consumed, and passes away with the secretions from the mucous surface. From its degeneration result pale ulcerations, reddish at their bases, and more or less deep in proportion to the magnitude of the pimples. Their uneven borders, like those of the pimples, are indented, the ulcerations resembling leaves that have been eaten by insects. On occasions, indeed, they present the true *worm-eaten* aspect (*vermoulures*):* their edges, however, continuing rather prominent so long as any thickening remains. These ulcerations, no more than those supervening on farcy-buds, show no disposition to cicatrize: commonly they spread, and never cicatrize at all.† When very deep, and they take to closing, they do so through forming indurated prominent cicatrices, in substance white, corrugated, and radiated.”‡

“The pimples or tubercles, or tuberculous risings upon the mucous membrane of the nose, form with more or less celerity, remaining a longer or shorter time in the state of pimple. Their progress is quicker than is commonly believed: I know for certain that from four to six days, at most, suffice for some of them to commence in pimple and terminate in ulcer.”

“The excoriations and superficial ulcerations of the nasal membrane in glanders take their rise in the same manner as the deeper ulcerations we denominate *chancres*. And similar lesions are to be observed upon the mucous membrane of the larynx, the Eustachian tubes, the trachea, and the velum palati. The *cartilages* of the nose, larynx, and trachea, become likewise, on occasions, the seats of tubercles and ulcers.”

clots of blood contained within the small veins of the mucous membrane, which (as well as the former) are often colourless.

* This is the “miliary ulceration” described at page 169.

† One reason for which is the nature of the (mucous) tissue in which they are seated, very different from the *cutis vera* under disease.—(Author.)

‡ I have often observed this puckered, radiated cicatrix: indeed, I have preserved several specimens of it as proofs that there are occasions on which glanderous chancres heal up.—(Author.)

“There are other lesions of the Schneiderian membrane which still bear the strongest analogy to certain forms of farcy. These consist of pimples, more prominent than the preceding, rounded, solitary or confluent, and either red at their origin, or else white, surrounded by a circle of red. At first they are hard, but they soon grow soft and turn to ulcerations, which spread with rapidity. Their especial seats are the places whereupon appear the tubercles, and the variously disposed tubercular masses; the regions, in fact, in which exist the greatest number of lymphatics. This form (of the disease) is always marked by acute symptoms, and by lesions spreading over the membrane of the nose, the sinuses, and the larynx. Very extensive ecchymoses take place in the mucous membranes and fibrous tissues underneath the nasal cavities; and these hæmorrhages are, on occasions, followed by destruction of the ecchymosed tissues.”

“THE LYMPHATIC GLANDS, those in particular receiving the lymphatics from the affected parts, are larger than in their natural condition, softer in substance, and pale (*blafardes*), and contain little yellowish-white masses, the transformations, probably, of the altered lymphatic fluid. In some cases this liquid appears to be infiltrated into the tissue of the gland, in others, to be accumulated in little sacs,” &c.

“I have met with tubercles, or rather deposits of albuminous substance, in the glands of horses affected with all kinds of glanders and farcy. But these deposits are by no means infallible signs of the *chronicity* of the disease. And this is a point I wish to lay stress upon, since it seems to correct an error which by many, as well as by myself, has been long entertained.”

“In glanders and farcy, the lesions we have denominated *tuberculosis* in the glands, are found within the lungs, the liver, the spleen, the testicles, &c. And, moreover, I have observed, in respect to the lungs, that the tuberculous growths exist in greater numbers, and become farther developed, than in any other organ. And I therefore think that the respiratory passages are the especial seat of the transmission of glanders; and that they likewise have the greatest influence in generating the spontaneous disease. Glanderous pulmonary

tubercles are exceedingly abundant wherever lymphatics are most numerous."

"THE PULMONARY GRANULATIONS met with in glanders and farcy bear great resemblance to the encysted tubercles of the lymphatic glands. They are often found in numberless abundance in the middle of the pulmonary crepitating tissue. They consist of deposits of albuminous matter, solid or liquid, enclosed within cysts of palish gray aspect, which, perhaps, are nothing more than air-vesicles whose walls have acquired morbid thickness. They frequently commence by red points, whose centres, in time, turn white, remaining for a while enveloped in a red case. At length the enclosed matter suddenly becomes softened, then hardens again, and turns of a calcareous nature."

Such is Leblanc's practical exposition of the nature of glanders and farcy. The important novelty in it, is, that he has brought forward proofs, as far as morbid anatomy with the aid of chemistry would supply them, that glanders, like farcy, is a disease of the lymphatic system; that the pimples or tubercles observable in the incipient stages of glanders are nothing more than so many farcy-buds, which in time become pustules, and burst, and end in turning to so many open, foul, spreading ulcers. Dupuy regarded glanders as identical in nature with farcy; but then he confounded both—along with other diseases, such as phthisis pulmonalis, strangles, &c.—under the appellation of *tuberculous disease*; and, so far from telling us that the tubercle is a farcy-bud, insists upon the farcy-bud being a tubercle: "farcy-buds," says he, "are nothing else but *scrofulous tubercles*;" admitting, however, that tubercles are *organic productions*; and that "they are found in the greatest numbers *in the course of the large veins pervading the septum*,"—"pursuing the course of the large blood-vessels:" the very course we know the lymphatic vessels take.

Assuming, then, that the lymphatic vessels, together with their glands, are the parts primarily or essentially diseased in glanders and farcy, it next becomes our business to inquire in what the morbid action consists, and, if we can, to find out in what part or tissue of the lymphatic vessel it originates, or is

principally seated. Coleman regarded farcy as *a specific inflammation besetting the internal coat* of the lymphatic vessel; and, considering the heat, and swelling, and tenderness of a farcy-cord at its first formation, and the ordinary conversion of the buds from a hard into a soft state, and the final change of them into *pustules* or abscesses—the same as happens with any common pustular tumour of the cellular membrane—there can be no doubt but that the morbid process is, during this stage at all events, of an *inflammatory* nature; and that it is *specific* as well, we argue from the fact of the pus or matter produced by it being capable of procreating the disease (either glanders or farcy) in another of the horse species. We are assured by Leblanc, that this bud, whether it be a farcy-bud or a glanders-bud, and be, as the latter, denominated either *pimple* or *tubercle*, consists of *albuminous* matter; and that, when the usual conversion of this into purulent matter does not follow, calcareous deposit has been found: thus satisfactorily accounting for the degeneration of farcy-buds into hard callous tumours or tubercles, and, perhaps, likewise explaining the pathology of such glanderous affections as we denominate *chronic*, on account of their length of duration without breaking forth into the ulcerative stage. The irregular, knotted appearance, of the farcy-cord, that appearance of it which first, no doubt, gave rise to the appellation of *farcy-buds*, was accounted for by Coleman, out of the circumstance of the valves—which we know to be very numerous in the lymphatic vessel—not being susceptible of the specific inflammation; “for if one of these diseased vessels be examined,” said the late Professor, “perfectly sound partitions of membrane will be found between the knots, which cannot be anything else but the valves.”*

Whether the *pulmonary* glanderous tubercle is to be regarded as no more in its nature than a farcy-bud, and whether the pulmonary tubercle of glanders bears any, and how much, analogy to the tubercle of phthisis pulmonalis, are questions not so easily solved. Leblanc assures us, as far as his examinations have gone, of the identity of the former; but he is silent in regard to the latter, although Dupuy hesitates not to pronounce them in nature both alike. For my own part, I feel

* See the third volume of the Author's Lectures on the Veterinary Art.

disposed to think, that the production which is taken for and called a pulmonary *tubercle* in glanders or farcy, but which may turn out to be nothing but a portion of diseased lymphatic, must be a different thing from *veritable tubercle* of the lung, concerning the origin and seat, and nature of which such various opinions have at one time and another prevailed among human pathologists, and which we now find described by—perhaps the best authority we have—M. Louis, as follows :

“It may now be inquired, in which of the various systems of organs composing the lungs does the development of tubercles take place? It results from the researches of M. N. Guillot, that the ramifications of the pulmonary artery, as far as they can be traced, are smooth, and free from tubercle; so that the opinion of those who place the primitive seat of the product *in the vessels* is with difficulty tenable. On the other hand, according to the same observer, if the bronchial ramifications of the tuberculous lung be cut open as far as possible (the organ having been previously injected in such manner that the fluid used shall have filled the entire web formed by the bronchial arteries on the surface of the tubes) *morbid changes are invariably detected in these*. The earliest stage of change appears in the form of a small whitish speck, produced by a semi-transparent matter, of rounded or elongated shape, and resembling the miliary tubercle pretty closely in colour and consistence, or still more closely a small fragment of epidermis macerated in water. At this period no vascularity is discoverable in the subjacent mucous membrane. In the second stage, the whitish semi-transparent matter is thicker and more spread out, and the correspondent part of the parietes of the bronchial tube is destroyed within variable limits. Hence it follows, that the production of tubercle does not take place in the pulmonary vessels, but *in the bronchi*—a doctrine which, as is well known, is that professed by Dr. Carswell. It is true, adds M. Guillot, that at the period when the morbid matter may be made the subject of examination in the bronchi, there have already existed tubercles in the midst of parts of the organ inaccessible by means of instruments; but is it not fair to presume that the phenomena of which I have just spoken may have equally well taken place *in the ultimate cul-de-sacs of the respiratory system*? It is, however, matter of very little consequence whether the primitive seat of a tubercle placed in the centre of the lungs be *the internal surface of a pulmonary vesicle*, or *the substance of the wall separating each pair of cells*: the extreme tenuity of these parts is well known, and the attempt to localize a lesion at its origin in the midst of such excessively delicate parts, could really lead to no useful result.”*

That the purulent matter contained in the suppurated pul-

* ‘Researches on Phthisis.’ By P. A. C. Louis, M.D. Translated from the French by H. H. Walshe, M.D.

monary tubercle of a glandered horse will, through inoculation, produce the same disease in another horse—even “as surely,” to use Professor Sewell’s expressive language, “as one potato will produce another”—admits no longer of doubt: yet no one, I imagine, will assert, that the glanders or farcy is producible by matter taken from a vomica in the lungs of a horse that has died of *phthisis*, or any other ordinary pulmonary disease. This fact may not of itself be sufficient to prove one so-called *tubercle* in the lungs to be different from another; weighed, however, with what has been before advanced, we think it strengthens our opinion, that the pulmonary tubercle of glanders, and that of pneumonia or phthisis, are substantially different productions.

The question we shall next consider is, whether the lymphatic system in horses, the same as in men, be liable to derangement or to inflammation from *common* or simple causes? My own experience bids me answer in the negative. That such a case, however, has happened, and, consequently, may happen again, exception as I believe it to be to the laws of hippopathology, I certainly would not take upon myself to deny. A punctured finger often, in a man, proves the origin of an inflammation of the lymphatics of the arm, enlargement of the glands of the axilla, &c.; a tight shoe often gives rise to similar disease upon the leg and thigh, and in the groin. But in horses, although great and fearful mischief may arise from a puncture, yet, if it be into muscle, shall we have fascial inflammation, or, into tendon, thecal inflammation, in both cases without any apparent lymphatic disturbance. As I said before, however, I do not mean to assert that we *never* see what is called *absorbant irritation* springing from common causes: I believe the following case to be a rare example of it, and therefore have I deemed it worthy of insertion in this place:—

C 25. Black troop mare was brought to me on the 30th May, 1842, on account of having got her fore leg injured by being over the bail, a very common accident in barrack stables. The arm was swollen, and she halted upon it. Use fomentations to the injured part, and give her some cathartic medicine, and let her be gently walked out twice in the course of the day.

June 3d.—She has been, and continues, purging. The swollen limb diminishes.

6th.—Instead of gradually subsiding into the healthy condition, as ninety-nine out of a hundred of these trifling cases do, her arm has taken to swell again, and is becoming tense, and hard, and warm.

8th.—To-day there is plainly discoverable to the feel, in the course of the plat vein, corded tumefactions, which seem to me to be enlarged lymphatics; the lymphatic irritation being combined with fascial inflammation of the whole arm. She now halts exceedingly in her walk, and cannot bear to have her injured member handled or compressed. There is but little constitutional disturbance, and her appetite continues good. A trial was made to confine a poultice upon the part after the fomentation, but, in the end, it proved fruitless; the weight of the poultice and the movements of the animal continually displaced it.

10th.—The tumefaction has extended both upward and downward. Take blood from her jugular, keep her bowels acting, and be unremitting in the use of fomentations.

15th.—The swelling is much reduced. Use cold discutient ointment and diuretic medicine.

18th.—There is remaining a cord of tumefaction in the axilla, taking the course of the plat vein, but it has lost its morbid sensibility. I cannot, by the most careful examination, satisfactorily determine upon the existence of matter deep-seated. Apply the *acetum cantharidis* to the cord.

19th.—The blister has resolved our doubts. There is now evident fluctuation in the cord. A lancet plunged *deeply* into it let out some well-concocted pus. Another abscess was found close up against the sternum. Subsequent probing proved that the matter had a good deal under-run the fascia. Foment, &c., as before.

21st.—She may now, in a gentle manner, resume her walking exercise, and have a weak solution of sulphate of zinc injected into the punctures in her arm. From this date she went on doing well, without any relapse, and was, on the 19th of July following, sent to her duty.

Notwithstanding the case just related *appeared* to be one shewing the possibility of disease of the lymphatics arising from an ordinary cause, yet at no stage of it did it assume the aspect of farcy;—never could it have been mistaken by an experienced hand for farcy. I, therefore, feel little hesitation in coming to the practical conclusion that the lymphatic system of the horse derives disturbance producing phenomena of a certain well-known character *from no other cause but farcy or glanders*; a fact which militates much in favour of the doctrine of a specific poison or *virus*. Were it otherwise, did common irritants annoy the absorbent system, or did that system contract disease simply under unhealthy conditions of body, as

is Mr. Vines' opinion, we certainly ought to have cases of farcy and glanders, or cases analogous thereto, a great deal oftener than we now see them. But, if we suppose the necessity of the presence of *virus* or poison of some sort to produce such an effect, and recollect that this virus, should it not be taken by contagion, is only seen generated in the body under certain impure or mephitic states of atmosphere, or under certain infected conditions of blood, we can at once account for the comparative rarity, at the present day, of glanders and farcy, and, at the same time, for the efficacy of such prophylactics as have been recommended and used for their prevention. We may, therefore, with truth say, not merely that glanders and farcy are *a* disease of the lymphatic system, but emphatically *the* disease of that system; for we know, in horses, of no other—at least, no other that produces the corded, tuberculated, knotted condition of the lymphatic vessels; that condition which turns to suppuration and ends in ulceration of their canals, one upon which remedies of an ordinary description make little or no impression.

FROM THE LYMPHATIC VESSEL, in which it has its origin, glanders spreads into the substance of the mucous membrane, farcy into that of the cutis vera, involving both one and the other in the morbid action and its consequences; the substance of the lymphatic vessel, in the language of Leblanc, “becoming consumed, and passing away with the secretions.”* The changes the mucous membrane undergoes under such circumstances have already been described;† those the skin experiences when invaded by farcy will become the subject of our consideration in another place.

IS GLANDERS A CONSTITUTIONAL OR A LOCAL DISEASE? Under ordinary circumstances, I answer, a *constitutional* disease; and in proof of this assertion I allege, first, the febrile commotion discoverable in the system; secondly, the eruption of the disease in the form of farcy, in some remote or other part of the body; thirdly, the contaminated condition of the blood; fourthly, the inefficacy of topical remedies by way of cure.

* Page 288.

† At page 166, et sequent.

THAT CONSTITUTIONAL DISORDER accompanies or speedily follows that which, to the superficial observer, has the appearance of being but a local disease—a disease confined, as Lafosse thought, to the nose—has been shown in our account of the symptoms ;* and that such disorder originates out of the infection of the system, the same as signs of ill health, slight or severe, arising after inoculation of the human subject for small- or cow-pox, proclaim the constitutional efficacy of the inoculation, to me appears highly probable. In cases where glanders or farcy has been the product of inoculation, it is possible such constitutional disorder may not be observable ; and this may have led Leblanc to believe that “ horses that become glandered and farcied *without* this premonitory disorder derive the disease from contagion.”† In the cases, however, of the horses of my own regiment,‡ which I cannot ascribe to any other source but contagion, the same constitutional disorder was manifest ; and this is a circumstance which precludes me from assenting to Leblanc’s inference, further than that, in the case of absolute inoculation, such disorder may not, as I said before, be detectible.

THE ERUPTION OF THE DISEASE IN SOME OTHER PART of the body is pretty satisfactory evidence that the virus or infection has travelled from the head through the system into the limbs, or into whatever other part of the body may happen to prove the seat of eruption. Even supposing the contagion or infection from without to be imbibable by the skin as well as by the aërial membrane, the natural conclusion still is, that the former in a horse already glandered, received its infection through the medium of the constitution. Lastly, we come to that irrefragable proof of the constitutional nature of glanders and farcy afforded by

TRANSFUSION OF THE BLOOD, from out of the vessels of a horse affected with glanders or farcy, or both, into those of a horse free from any such disease, and the production thereby of the disease—glanders or farcy, or both—in the latter subject. That such an experiment has been made on more occasions than one at the Veterinary College, in the time of the professorship of Coleman, is well known to many members of the profession

* At page 162.

† At page 163.

‡ At page 230, et sequent.

now living, several of whom, indeed, have been eye-witnesses of it ; and that the results have proved such as to leave no room for doubt concerning the morbid or infected condition of the blood, can be indisputably attested. If there be in existence any records or detailed accounts of the experiments, they are unknown to me. For my own part, I regret there should exist none. I have, however, always understood that the (healthy) subject into which the blood has been transfused has commonly been an ass, previously prepared for the influx by bloodletting, and that the blood transfused was derived from the carotid of the glandered horse, through a stop-cock inserted and fastened into the vessel, to the opposite extremity of which was affixed an *ureter* ; a kind of tube found to answer extremely well as the medium of communication between the stop-cock in the carotid of the horse and another stop-cock fixed into the jugular vein of the ass. The current of blood being turned on, was allowed to flow until such time as revivification of the ass, asphyxiated from previous loss of blood, had become established. And the uniform result—whenever the ass survived the operation, for, now and then, as happened to myself in an experiment of the kind I made years ago, the ass died either under it or in consequence of it—I repeat, the uniform result was, the eruption of glanders or farcy, or both, in the ass, after a very short space of time, and in so virulent and malignant a form as to destroy the life of the animal (through suffocation) in the course of a very few days afterwards.* Transfusion, as was very properly remarked by Coleman, furnished a sufficient *dose* of blood for the production of the disease, and seemed completely to overturn John Hunter's notion, that the blood could not be diseased since inoculation with it proved harmless :† indeed, this important experiment brought to light two facts of immense value to pathologists ; one being, that the mass of blood could harbour and transmit disease ; the other, that one of the diseases so harboured and thus capable of transmission was glanders and farcy.

* In the absence of any record of this truly interesting and important experiment, this is the best account, from memory, I can give my readers.

† See the Professor's own ingenious and convincing arguments on this point at page 261.

The circumstance of a horse affected with glanders or farcy recovering, after a short time, his usual health and spirits, or even never ostensibly losing them under the disease, is no valid argument against the constitutional essence of the disease. There is a class of diseases affecting man, eruptive in nature, and several among them contagious—the *exanthemata*—whose character it is to commence with fever, which, on the appearance of the eruption, either altogether leaves the patient, or much abates in violence; and to these diseases glanders and farcy, in this respect, may be said to bear more or less analogy: this, however, is not the case with syphilis, even after it is supposed to have become constitutional; a circumstance in which it differs from glanders, though by many between the two diseases there has been thought to be, and it must be confessed there certainly is, in some other respects, a good deal of resemblance.

Of the fourth proof of the constitutional nature of the disease, viz.:

THE INEFFICACY OF TOPICAL REMEDIES, I shall speak when considering if any and what treatment is likely to prove available in glanders and farcy.

UNDER WHAT CIRCUMSTANCES, IF UNDER ANY, GLANDERS MAY BE REGARDED AS A LOCAL DISEASE, it is not easy with any certainty to determine. Inoculated glanders or farcy, making its appearance at the usual period—about the third day—after inoculation, may be or may not be so considered; and the same might be said of such cases of proved contagion whose origin bore any analogy thereto. Cases, however, in which, although contagion appears to be the cause, weeks or months elapse before the disease shows itself, should be viewed, I think, as the result of the contamination of the system. And so, likewise, ought every case originating in pollution of the blood from the inhalation of mephitic gases—in other words, from the *miasm of the stable*—to which Coleman attributed such universal and exclusive influence: proving that, according to his notions, almost every case was constitutional. Mr. Youatt, however, who is a great contagionist, defines glanders to be an inflammation of the Schneiderian membrane, “*strictly local* for awhile, and often for a long while, and during its insidious

state;”* resting his opinion upon the circumstance of the horse enjoying his health. If, however, as others and myself have observed, glanders commences with that disturbance of the health which indicates—as appears natural to suppose it does—contamination of the system, the same as the febrile commotion perceptible after inoculation for small-pox or after vaccination, affords a test to the surgeon that the constitution has felt the inoculation in consequence of the absorption of the virus applied locally, then it seems natural to infer that glanders from that time becomes a constitutional disease, although, like syphilis or scrofula, it may remain long lurking in the constitution without coming into secondary or destructive action, or even interfering with the ordinary vital operations. Another argument against glanders being a local disease is the general inefficacy of all topical measures employed for its cure: had it consisted simply in inflammation or ulceration of the Schneiderian membrane, Lafosse and others, with their detersive and healing injections and fumigations, must, most assuredly, have been more successful in their practice than we know them to have been. How it happens that a disease, constitutional from its beginning, should assume all the characters of a local malady for a longer or shorter period of time, and then all at once, as it were, reassume the constitutional form, and that of a far worse character than before, we do not pretend to be able to give any explanation of, further than such as is afforded by comparison with those diseases of the human subject which have heretofore been adduced by way of analogy. But that so stands the fact is sufficiently proved by Coleman’s experiment of transfusion, supposing that the subject from whom the blood was drawn—which we believe to be the case—showed no more than the ordinary glandered—apparently healthful—condition.

THAT THE POISON OF GLANDERS, after its absorption, may be latent or inactive in the system for weeks—months even—the same as the virus of syphilis is known on occasions to be, and as that of rabies always is—to me is satisfactorily shown by the case of C 21 horse.† Whereabouts was the virus

* Mr. Youatt’s Lectures in ‘The Veterinarian’ for 1832.

† Given at p. 233. See, also, the same question discussed at pp. 236-7.

lurking during the fifteen weeks' interval between his exposure to the contagion and the actual eruption of disease? Was it circulating in his blood? and, if so, why did it not, as in the cases of the Colonel's chargers and A 24 horse, show itself before? After so long an interval it is hardly possible to conceive the disease, when it did appear, could be *local*. Rather would it seem that, notwithstanding the blood is contaminated, yet does no topical eruption happen until such time as certain parts or localities have acquired a *predisposition* to admit of the eruption. Should the animal, whose system is supposed to be already infected, contract a catarrh or have the strangles, the certainty is, that either one or the other will turn to glanders; or should he get swelled legs or injure his limbs in any way, the lesion or tumefaction will surely turn to farcy. After all we can say or surmise, however, on this abstruse subject, there is that strange, unaccountable caprice, as regards their effects, about contagions and the poisons or viruses of contagion, that defies all science or art to bring their action within the compass of any known laws or principles: we can only adduce facts—or what appear to us to be such—and by them, and them alone, we must be guided in the narrow circle wherein we dare reason upon them, and out of which we dare not permit our reason to wander.

OF THE NATURE OF THE (so-called) VIRUS OF GLANDERS we know no more than we do concerning the supposed viruses or poisons of syphilis, rabies, variolus, vaccinea, &c.: we have the same ground for arguing the existence of virus as there is for doing so in the diseases just named, and no more; all the knowledge we possess in regard to the virus of glanders arising out of the observations we have been enabled to make of its operation and effects. Indemonstrable, however, as the virus is in any abstract, palpable form, yet have we no conception, at least according to the views we take of the pathology of glanders, of the existence of the disease without its presence. We do not imagine, as we said on a former occasion, that simply an unhealthy or ill-conditioned state of the body can give rise to glanders or farcy. We believe that the specific virus must, in some form or another, somewhere or other exist.

One of the strongest advocates for the doctrine we are now

propounding was Coleman ; and yet, towards the latter part of his professional career, in consequence of some experiments he had recently made, did Coleman at times suffer himself to doubt whether there absolutely was such a thing as the virus or poison of glanders, or rather, whether its presence was absolutely necessary to the production of the disease. I am led to say thus much from minutes* made by myself of a conversation I had with the Professor so long ago as June, 1824, in the course of which he informed me, that he had produced discharge from, and ulceration of, the Schneiderian membrane, and all the symptoms, in fact, of glanders, simply by throwing muriatic acid gas (chlorine) into the frontal sinuses. But this was no more than Lafosse had done, and afterwards had adduced as a strong argument to prove the correctness of his doctrine of the *locality* of glanders, and its consequent curability by topical means, and never to my mind can bring conviction that inflammation and ulceration of the aërial membrane, brought on by *common* causes, is identical with glanders. As well might we say that a carious tooth or a diseased maxillary bone or a violent catarrh constituted glanders. Unless we associate with our notions of the nature of glanders the existence, demonstrable or imaginary, of a poison or virus, the term *specific* is no longer applicable to the disease, and any case may bear the denomination that happens to show fetid or gluey discharge from the nose and ulceration of the nasal membrane, whether there exist lymphatic disease or not; though, as I have in another place observed, should the lymphatic vessels and their glands prove to be in a state of disease, the probability—dare we say, certainty—is, that the case is glanders and farcy; and for this reason, that lymphatic disease, at least of the *same* character, arises in the horse from no other source of irritation.

* The opinions broached by the late Professor appeared on this occasion so strangely at variance with what I had always conceived to be his pathology of glanders, that I could not resist the impulse I had at the moment to make a memorandum of the conversation; and it is to this my present observations have reference.

FARCY.

DERIVATION.—Our word *farcy* is a modification or alteration of the French word *farcin*, the etymon of which is from the Latin verb *farcire*, to stuff. Vegetius called the disease *morbis farcimosus*, the *stuffed* or *stuffy* malady; and certainly a farcinous limb exhibits very much of that character. The translator of Solleysell's 'Compleat Horseman' (Sir William Hope) introduced into our language the French appellation itself, *farcin*, and for many years afterwards the disease went by that name. We find the learned Dr. Bracken writing "on the *farcin*. Gibson appears to have been the first who ventured in print on the introduction of any innovation. At the head of his chapter he writes "of the *farcin* or FARCY," and in his description of the disease adopts the latter in preference to the former appellation. Still, however, though authors since his time, and veterinarians and horse-folks in general, have called the disease "*farcy*," yet is the old French name not altogether exploded from our language, it being by no means a very rare occurrence, even in our own day, to hear farriers in the country talking about the "*farcin*."

DEFINITION.—Farcy consists in the appearance upon such parts of the body as are known to give passage to the lymphatic vessels, of swellings in the form of nodous cords, called *farcy buds*, which in time ripen into *pustules*, and terminate in ulceration.

VARIETIES.—We distinguish, in respect to severity and rapidity of course, the same varieties in farcy as we do in glanders—the *acute*, *sub-acute*, and *chronic*. Acute farcy manifests equal virulence, and runs its course in almost an equally short period of time with acute glanders, in which disease it commonly terminates some short time prior to dissolution. *Sub-acute*, however, is the ordinary form farcy assumes; and a very irregular, fluctuating course in this form it is apt to take, remissions being more or less marked, or intermissions taking place of greater or less length, until at last acute farcy supervenes, and with the aid of glanders closes the scene. But the sub-acute disease may run into the chronic stage or variety;

all apparent morbid action may cease, or become suspended, the parts, the seat of disease, growing callous and insensible, the general health and spirits becoming quite restored, and the animal able to resume his labours. In this flattering condition the patient is too often pronounced and believed to be "cured;" when, in reality, the serpent is but "scotched, not destroyed:" one day, it is more than probable it will raise its head again, and assume a more virulent aspect than ever.

In addition to these varieties of intensity and progress or course, there is a kind of farcy which has a more superficial or cutaneous seat, and which farriers call *button farcy*, from the buds being smaller and more circumscribed than in the deeper-seated species, which they look upon as a more malignant and intractable disorder, commonly having its seat upon the insides of the limbs.

MR. BLAINE has noted another, a third variety of farcy; one, he says, "which is usually passed over by authors, and which is also one wherein the poison is self-generated, probably. It often puts on a chronic, protracted form, and shows itself by the affected horse becoming suddenly lame in one limb, the tumefaction and heat of which recede and attack the other limb in the same manner. In this way he (the horse) may remain for months with his health very slightly affected; at length, however, the disease assumes a more marked character, —some of the swellings ulcerate, and glanders eventually closes the scene." *

SYMPTOMS.—Farcy, like glanders, is generally ushered in by tokens of ill health. The horse, perhaps, is said by the groom to have "caught cold," or to be "humoury." He is out of spirits, and loathes his food, or eats it only in part, and with little appetite: his coat has a roughened, lustreless aspect; his pulse is quicker than natural, and his mouth warmer; his hind legs, perhaps, fill a little, or one may swell and not the other, and he evinces some stiffness in his movements, or may be actually lame in one of his limbs. I have known horses so lame from farcy, before the disease had in any local or characteristic form declared itself, that shoes have been removed and

* Op. cit., page 218.

feet searched, &c., to discover the seat and cause of lameness, no suspicion having existed at the time that farcy was present in the animal's system. It may so happen, however, that none of these preliminary symptoms are observed or observable; that, on the contrary, farcy at once develops itself in an attack on some locality, most probably one hind limb. Indeed, so sudden and sharp and severe are attacks of farcy in some instances, that in the course of one night the horse's limb will be swollen to a frightful size, so as to incapacitate him almost from turning in his stall and walking out of his stable. Ordinarily, the development of farcy plainly accounts for the halting or lameness: now and then, however, as I said before, the lameness appears *without* any ostensible cause.

Viewing the affected limb from behind, we perceive a fulness on the inside of the thigh, along the course of the femoral vein, and the application of our fingers to this will immediately detect a corded nodous swelling, which has been, happily enough in the sensation it conveys to our feel, compared to "a cord with so many knots tied in it." This at once is declarative of disease of the lymphatic vessels—of the presence of *farcy*. The fasciculus altogether may be of the magnitude of a person's wrist: it is hot to the feel compared with what the parts naturally are, and, when handled and compressed, flinches from pain: now and then, indeed, it is so exceedingly sensitive that the slightest pressure upon it causes the horse to catch up his limb, and in that unexpected and awkward manner that may prove the occasion of a blow to the examiner unless he be on his guard at the time of the examination. Tracing the cord upwards from its place of origin—which commonly is above the hock—the hand is carried into the groin, and there discovers a lobulated tumour, a swelling of the inguinal glands, which may, without impropriety, be called a *buboe*; sometimes, however, the buboe does not make its appearance until after the full development of the cord.

Farcy does not at all times commence its attacks in this open and unambiguous form; on occasions it presents itself in a shape so insidious that at first we hardly suspect it to be farcy, unless there happen to be present circumstances to induce suspicions of its existence. Sometimes, one of the

limbs—most likely a *hind* one—will swell *below* instead of above the hock, and the swelling will increase around the fetlock, and an abscess will form there. In other cases, blotches or isolated pustules will break out upon the limbs—more likely upon the inner than the outer sides of them—or upon the body, or upon the shoulders, neck, breast, or quarters; and these will break and discharge among the hair clothing those parts an ichorous or dirty-looking thin puriform matter. We trim the hair off one or more of these blotches, as they happen to arise, and find them with a yellowish sloughy base, which by some escharotic dressing, or by cauterization, we soon reduce to a healthy granulating surface: in the mean time, however, while we are doing this, others make their appearance, and in some remote part, perhaps: this may serve to increase our suspicions concerning the nature of the eruption, and yet not confirm them. Any doubts we may still entertain are not doomed, however, to long duration. Soon will corded lymphatics be discovered issuing from one or other of these patches of pustules, running into buboes, and thus resolving, beyond all question, the veritable nature of the case.

THE GENERAL SWELLING of the surrounding parts, which ordinarily *accompanies* the development of farcy-buds, may not come on until some time afterwards: rarely does it precede the buds. The common attack includes the simultaneous appearance both of buds and swelling: the hind limb—for that is the part, of all others, likely to suffer—becomes swollen from quarter down even to hoof, and often, as I said before, to an alarming degree, exhibiting everywhere heat and tenseness and tenderness, and feeling oily or greasy upon the surface, from some sebaceous exudation. The whole limb is evidently seized with a violent inflammation, and the fever observable in the system is commonly in some sort of proportion to it. What affects one appears to affect the other: as the one declines, in consequence of the buds coming to maturity, the other declines, and should one, after abatement or subsidence, show a tendency to exacerbation, the other will be found to manifest a similar disposition.

The unwillingness with which the patient moves, the stiff and awkward manner in which he drags his farcied limb after

him, tell plainly of the pain and inconvenience motion puts him to; and yet, when so much swelling sets in, we by practice find that exercise is one of our most influential agents in bringing about a reduction of it.

After the inflammation has reached its acme, and is on the decline, the swelling, somewhat diminished, becomes altered in nature from an inflammatory to an œdematous one; parts that before were hot and tense and tender, now become hardly warmer than in a state of health, lose all their morbid sensitiveness, and *pit* under the pressure of the finger. In fact, the disease, so far as the general tumefaction is concerned, is now assuming one of those forms to which farriers of old applied the ambiguous appellation of “watery farcy.”

THE FIRST STAGE OF FARCY, from what has been said, will be found to consist in the development of the farcy-bud, and to last so long as the bud retains its properties of solidity, heat, and tenderness, and is accompanied by inflammatory tumefaction and lameness.

THE SECOND STAGE is commonly a *suppurative* one. The solid bud gradually grows soft from centre to circumference, and at length becomes a *pustule* or little abscess, which as soon as ripe bursts or, rather, gives way at the most prominent and thinnest part of its capsule, and admits at the place where it has partially burst the tardy escape of its contents, part of them being still retained by the flaps of the capsule and the investing hairs. In this sparing or partial manner does a farcy pustule unload itself when left to break in the natural way: in time, however, the remains of the capsule become absorbed, and then we have exposed to view a *farcy ulcer*.

THE MATTER DISCHARGED FROM A FARCY PUSTULE ordinarily is puriform. It is not, however, what we should regard as laudable pus; it is thinner in consistence, and has a dingy or dirty yellow or white aspect, and is offensive. Now and then it is bloody: in other cases it is more of the nature of *ichor*, or an ill-conditioned fœtid serum, than pus. Farcy pustules that have, from some apparent deficiency in the adhesive inflammation, extended their usual or natural limits, and thus become abscesses of comparatively large size within the cellular tissue, are those most apt to manifest a secretion or effusion of this latter description.

The second stage of farcy is not invariably suppurative. Now and then the disease takes quite a different turn. The farcy-bud, instead of becoming soft, grows firmer and harder, insensible and indolent, and in time acquires a most unusual induration, one amounting to *schirrosity*; and in this condition may continue for an indefinite length of time, the horse appearing to have quite recovered his accustomed health and spirits, and seeming, and working with his "big" leg, as though he ailed nothing. And work now will do his farcied limb good; it will prove a stimulant to absorption, and in time, considerably reduce the size of it. Let not his master, however, fondly hope, or believe the flattering tale, that his servant is "cured." No, no! this state does not constitute cure, but rather check or arrest. One day, it is to be dreaded, a fresh eruption will make its appearance, either in the enlarged limb or in some other, perhaps remote, part of the body; nay, glanders may unexpectedly present itself: and then comes home to the mind of the master the utility and truth of the warning he had received, but may possibly have disregarded.

THE THIRD STAGE OF FARCY is the *ulcerative*. The pustule has broken, its overhanging flaps of capsule have disappeared, and an ulcer of a *chancreous* description is disclosed to view, large or small, in accordance with the size of the original bud, circular in figure, having its surrounding edge inverted, its base yellow and strewn with bloody points. In consequence of the cutis, after a time, becoming its seat or *nidus*, and also, in some measure, owing to its lying exposed to the air, and especially if any escharotic or detersive application should happen to have been used to it, the farcy ulcer will by degrees, in a sound constitution, assume a healthy aspect, and evince a disposition to granulate; and very often, with a little medical care, will granulate and heal up, and even cicatrize; at other times, and particularly so long as any morbid action continues to prevail, do all we can, the sores can be made only to dry up. When, however, the constitution of the animal is unsound or unhealthy—from disease of the lungs or other cause—the farcy ulcer will often manifest a phagedænic or sloughing disposition, extending itself into the surrounding tissues and such as are deep-seated, consuming them all alike in one common destruction. Now and then the ulcers change into what has been called the *cancer-*

ous condition: they lose all propensity to spread, and yet cannot be got to heal; they dry up, and their surfaces grow hard and acquire in time the same sort of insensibility and indolence that farcy-buds do when they refuse to proceed to suppuration.

THE PARTS MOST OBNOXIOUS TO FARCY are the *hind limbs*; next to them, perhaps, the *fore limbs*; then the *breast*, the *head*, the *neck*; and, lastly, the *trunk*. In whatever member or part of the body the eruption takes place, we look for the disease in the situation and course of the lymphatic vessels, which, for the most part, is the same as that of the larger blood-vessels. Thus, when the attack is on the hind limb, we expect to find the cords of farcy-buds running up the inside of the thigh; when on the fore limb, along the inside of the arm; when on the breast, along the axillary hollow, in the course of the plat vein; when on the head, about the lips and lower cheek, from the angle of the mouth towards the lower jaw and into the sub-maxillary space; when on the neck, frequently taking the course of the jugular vein. As a general observation, we feel warranted in asserting that the nearer the head farcy makes its eruption the more the danger of glanders following, though it be a rule to which very many exceptions will present themselves in the routine of practice. When the head itself becomes the part attacked by farcy we may entertain the greatest apprehensions of glanders approaching. Commonly, one hind (sometimes one fore) limb is affected to the exclusion of the other; at other times, a hind and fore of the same side will prove so, the disease confining its attack still to one side of the frame: it does not often happen that either *both* hind or fore limbs are simultaneously affected. When the attack is a *general* one, all four legs will become diseased.

A remark everybody has made in respect to parts attacked by farcy is, that the disease exhibits at all times almost a predilection to places where the skin is thin, and nearly or quite hairless: the insides of the thighs and arms, the lips, nose, &c., are all common localities for farcy. Why is this? Is it, that the contagious or miasmatic effluvia gain admission through the pores of the skin in these places, and produce in them, in this direct manner, a local disease?—or is it a mere incidental circumstance, one referable, not to the thinness of the skin, but

owing to such places being coursed by the principal trunks and major number of the lymphatic vessels? Without taking on myself to refuse all belief in the possibility of contagion or miasm affecting the lymphatics through a thin hairless cutis, or to its entering into their canals through the pores of the latter, I must say that the impression on my mind is strongly in favour, as in the case of glanders, of constitutional taint, in the generality of cases *prior* to the local eruption; in all, very shortly afterwards. Still, I repeat, I would not go so far as to deny that farcy, as well as glanders, might, in some cases where contagion or miasm had been operative, be for a time, longer or shorter, according to circumstances, simply a *local* disease.

COLEMAN assigned as a reason for the *hind* limbs being the especial seat of farcy, their distance from the central force of circulation. The more remote a part is from the heart, the more it is under the influence of causes extrinsic to the body; and so far this reason is valid. In my opinion, however, there is yet another reason to be given; and that is, the *work* the hind limbs have to perform in progression compared with what the fore, or any other parts of the body, have to do. This is found to have considerable influence in lameness; and every veterinarian knows that the hind limb is at all times more ready to take on inflammatory action—become “humoury”—than the fore limb; which does not seem altogether well to tally with its comparative remoteness from the centre of circulation, or, at least, to depend upon that cause alone.

OTHER PARTS than those that have been named become the occasional seat of farcy. The eyelids, the ears even, sometimes show the disease. In stone-horses, we are told by continental veterinarians, it is by no means uncommon to find the spermatic cord and testicle affected with farcy. Of our own experience we can allege that the mamma is occasionally so; the disease, when it is so, commonly extending into it from the thigh. In conclusion, we may safely assert that no part of the body can be said to be exempt from an attack of farcy. Now and then the disease will break out in a sort of *broadcast* form—appear over the body generally, without evincing any predilection whatever for those parts along which the principal lymphatics are known to take their course: on the contrary, will rise upon

the *outside* instead of upon the inside of the limbs—upon the shoulder, quarters, &c. This is

BUTTON FARCY, the other kind being distinguishable by the denomination of *cord farcy*. And we have remarked that, in this variety, the buds, though more numerous, are smaller in size, and continue so through the stages of suppuration and ulceration; thus bearing a resemblance to the *miliary ulceration* of glanders; the cord farcy being succeeded by a more true chancreous or phagedænic ulceration. This smallness and more numerous and general distribution arises, no doubt, from the exility of the ramifications of the lymphatics compared with their trunks and principal branches. Another circumstance in which these small buds differ from those of larger size, is their more intimate connexion with the *cutis vera*; they are frequently so incorporated in substance with it that no dissection can separate them. This, probably, arises from their having their origin in cutaneous lymphatics.

THE LYMPHATIC GLANDS commence swelling simultaneously with, or speedily after, the lymphatic vessels themselves; and when swollen they evince tenderness, and feel unusually hot likewise, plainly showing that they also have become the seat of inflammatory action. The glands that take on disease are those into which the farcinous lymphatics directly run, or through which they pass in their course into their common duct: should a hind limb or the parts of generation become affected, the *inguinal glands* swell; should it be a fore limb, the *axillary glands* tumefy; and the same glands become enlarged when the disease invades the breast and shoulder; and on the occasion of the head becoming the seat of farcy, the same glands—the *submaxillary*—tumefy, as they do when glanders is present. The *bronchial glands* may enlarge from disease deep-seated in the breast; usually, however, tumefaction of them indicates disease in the lungs. It is stated by Hurtrel d'Arboval, that the *mesenteric glands* have been found in a state of disease from farcy, as well as those of the *mediastinum* and *pelvis*. I cannot, however, for my own part, recall to mind any observations confirmatory of this; at the same time, I do not question the statement. All that I have to say in regard to it being, that when *suppuration* is named as having taken place in the

lymphatic glands, it would, in my mind, furnish an argument against the disease turning out to be farcy or glanders.

DIAGNOSIS.—The old writers on farriery seem to have had no standard whereby farcy was to be distinguished from some other disease resembling it. Any common anasarcaous swelling of the hind limb that proved to be general they called "*watery farcy*;" thus evidently confounding it with that œdematous state of limb which is known to be one of the concomitants or consequences of true farcy. Modern veterinarians, with their improved knowledge of pathology, have got rid of these erroneous notions, and by showing that farcy is a disease of the lymphatic system, have laid the foundation for a new and more orthodox hippopathology. We now know that no disease can be farcy that does not affect the *lymphatics*; I am not aware, however, that any veterinarian besides myself has carried his observations so far as to pronounce that farcy was the *only* disease to which the lymphatic system of the horse is obnoxious. And yet this, if established, is an important point, inasmuch as, then, our diagnosis becomes well defined and comparatively facile in practice. No swelling of a hind limb (or of any other part) constitutes a case of farcy apart from unequivocal signs of *lymphatic* disease: there must be present corded, nodulated swellings—*buds* in some form or other—together with actual or approaching tumefaction of the lymphatic glands, or the case is not farcy.

I cannot help thinking, from accounts I have perused in some veterinary authors, that both glanders and farcy have been mistaken; or rather, that diseases of another kind have been mistaken for them, and for farcy oftener than for glanders. One disease in particular, and one that is by no means so very rare in its occurrence, I feel quite certain has been called by the name of *farcy* and under this appellation appears to have been "cured," and to have been recorded as such. The disease I allude to is that which is now known by the name of *diffuse inflammation of the cellular membrane*: a disease consisting in the (generally sudden) appearance of lumps or patches of sub-cutaneous effusion of a solid and even firm description, attended by œdematous states of the limbs, belly, sheath, &c.; and thus having, so far, the additional character of *watery farcy*. But in these cases, let it

be well observed, there is no *lymphatic disease*,—nothing like *farcy-buds* and *cords* ; in which circumstance it is, connected with the course and termination these respective diseases are seen to have, that we are to seek for a correct diagnosis. But how are we to distinguish farcy-buds from some cutaneous eruptions—from *surfeits*—which appear so much like them ? There is but one species of farcy for which these eruptions can be mistaken ; and that is the diffuse or broad cast variety—the button farcy. Now, should the attack be farcy, the probability is, from its being a *general* one, that the animal will show signs of ill-health at the time ; whereas, a horse that has “broken out in a surfeit all over his body,” is commonly in unusually good, what is called “fine,” condition. Then, again, “surfeit lumps” are often large and irregular in form, and frequently appear in patches, whereas the buds of button farcy are small and regularly spheroid in shape, and spread pretty uniformly over the body. Again, surfeit eruptions are often but of an hour or two continuance,—rarely are they visible on the following day : any doubt, therefore, that may impend over the case is not likely to be of lengthened duration.

THE PROGRESS OF FARCY, always upwards, towards the heart or towards the head, will depend on the character it happens to assume. *Acute farcy*, as I have before observed, will run its course rapidly and uninterruptedly, the same as acute glanders is known to do ; with which, indeed, it is commonly at an early period, always almost prior to death, associated. *Subacute farcy* is apt at times to manifest a good deal of irregularity in its progress, at one time it being acute and full of virulence, at another in a state of indolence or absolute suspension, the patient appearing to be recovering from the disease. In the progress of farcy a good deal will depend on the state (of soundness or disease) the lungs happen to be in ; when they are already in a state of tuberculous disease, though the animal may, by care and judicious management, be kept up for a time, he will, in the end, turn what has been called “hectic” or (with less propriety) “typhoid,” and end his days in phthisis. As to *chronic farcy*, it is impossible to say how long it may remain in the state of inactivity and apparent harmlessness into which it has, either of its own accord or through treatment, relapsed, or

to make sure even for a day that it will not spring up again in the system in all the virulence of the acute disease, and put a speedy end to the animal's existence. The following case, communicated by Mr. Horsburgh, V.S., Dalkeith, to THE VETERINARIAN for 1843, is well adapted to show how rapidly and destructively farcy, when it is *acute*, frequently runs its course :—

On the 6th of April, 1842, Mr. Cossar, horse-dealer, bought from Mr. Thomson, another horse-dealer, a bay pony for £9, warranted sound. The pony was delivered to Mr. Vessy, inn-keeper at Dalkeith, without having been at all in Mr. Cossar's stables : Mr. Cossar also warranting the animal sound.

The pony being very fat, Mr. Horsburgh, V.S., was requested to give him a dose of physic on the 8th April. While giving the ball, Mr. H. perceived a mark below the off eye, like that of a recently-healed wound, but having a peculiar shining aspect, with a depression in its middle as though the point of the finger had been impressed upon it. This was noticed to the groom.

The morning of the 10th (the physic having been working the day before and set over night) the groom came to Mr. Horsburgh in a great hurry, saying, "The pony was all over swelled and stiff, and could scarcely move." Mr. H. found him as described, with the lymphatics swollen to that degree on his quarters, that anybody would have imagined he had been recently whipped severely. The mark under the eye was also tumefied.

The day after (the 11th) the disease was but too evident. The place under the eye had broken, and become a spreading sore; the lymphatics of the thigh were much swollen, and presented numerous farcy buds. The sub-maxillary glands were swollen and hard, and there was discharge from both nostrils.

13th. Every symptom shows the rapidity with which the disease is running its course. The head is swelling, the discharge from the nose greatly increasing, the limbs (the hind ones especially) much swollen, and farcy buds multiplying in all directions.

16th. Mr. Dick saw the patient, and, as he was in so hopeless and dangerous a state of disease, ordered him to be destroyed.

FARCY TERMINATES in various ways. The termination most to be dreaded, and, unfortunately, that which proves the most frequent, is in glanders—in *acute glanders*—and, as a consequence, shortly afterwards in death. On the other hand, farcy has on many occasions been known to gradually disappear, expend itself, as it were, in the part in which it broke out, and

the patient to recover. The disease confines itself to the part first attacked—to one hind limb; at all events, it does not spread either to the head or to the lungs, but manifests itself in a *local* form only, and in that form admits of removal or cure, or else, in the part attacked, degenerates into that callous, chronic stage that may last for nobody knows how long, and in which the horse can do certain work pretty nearly, or quite as well, as if his limb had no such thickening or enlargement about it as an attack of farcy is but too apt to leave.

The amount of work horses with limbs of this description, or with limbs actually breaking out with farcy at the time, will often do, and the length of time—even years—they sometimes are enabled to continue their work, without any spread or augmentation of their disease, is on occasions truly surprising.

As I said before, however, this is not a state of security. Glanders may at any time supervene on any fresh attack; or, should pneumonia at any time, or even a severe catarrh or influenza come upon the subject, the probable termination will still be glanders.

THE PROGNOSIS, in farcy, can under no circumstances be pronounced “favorable.” So long as the disease confines itself to one locality, and continues by degrees to give way to treatment, some hopes may be entertained of a termination in the indolent or chronic stage, or even of the disappearance of disease altogether: still, it must on no occasion be forgotten how in a day farcy may return in all its worst virulence, and be productive of glanders. As was observed on a former occasion, the farther the locality of farcy is distant from the head the less the probability, generally speaking, is there of its producing glanders: this rule, however, does not hold in all cases, many horses showing farcy in one hind limb breaking out in glanders, without any intermediate part, between the limb and the head, manifesting disease. The chronic variety of farcy, or the subacute that shows a disposition to run into that form or stage, is certainly that which affords the best prospects under treatment, or which may, even without any treatment at all, admit of the animal doing part or all of his

work ; but, even here, it is injudicious to make the prognosis too sure : it ought, under almost all circumstances, to be a *qualified* one.

THE CAUSES OF FARCY.

Whatever tends or operates to the production of glanders, the same has the power of causing farcy. Contagion becomes no exception to this admitted truth, supposing its agency to be through the medium of the constitution: contaminated blood is quite as likely to emit its virus in the form of farcy as in that of glanders. Coleman, however, appears to have viewed the operation of contagion in glanders as being *local*, upon the Schneiderian membrane ; and that, to take effect, it must have a local operation also in the production of farcy ; since, in his lectures, he informs us, that “ of all three affections (*viz.*, acute and chronic glanders and farcy) farcy affords the most conclusive evidence of the production of the disease *in the absence of contagion*.” Undoubtedly, it is out of the range of probability—out, almost, of that of possibility—for the inside of the thigh of one horse to come into contact with the nose of another horse, or, in fact, with any contagious virus, through chance or accident ; supposing, however, that the contagion enters the system before the local disease be produced, there is in that case quite as much likelihood of farcy following as of glanders. We know that, by inoculation, farcy has been produced by the matter of glanders, and glanders by the matter of farcy, and that, consequently, there is every reason to infer a similarity, or rather an identity in the viruses of the two diseases ; and in farther proof of this, as was said before, one disease, or form of disease, almost invariably terminates in the other prior to dissolution. There can be no question but that the same contaminated or miasmatic atmosphere of the stable or elsewhere which produces glanders may occasion farcy ; and *vice versâ*. The cases of the four horses of my own regiment* fully bear out this conclusion : three of them first showed *farcy*, the

* Given at page 230, et sequent.

fourth commenced with glanders. Surmising that the *virus* or animal poison, or *miasm*, or *malaria*, or whatever it may be, enters the blood, the part upon which it takes *local* effect will be that probably in which, from some cause or other, there resides the greatest amount of predisposition or susceptibility ; and further than in this obscure manner we shall find ourselves unable to account for any predilection manifested by the disease.

That farcy, like glanders, may take its rise from other causes than contagion and contagious miasms—from such as are comprised in our third, fourth, and fifth classes of exciting causes*—we have already stated there exist examples amply sufficient on record to show : the consideration being, as in the case of glanders, in respect to their operation, whether the system of the animal under such circumstances can be said to be in its *natural* state ; whether, on the contrary, facts would not warrant our assumption, that some morbid or peculiar susceptibility did not at the time exist in the lymphatic system—something more than mere unhealthiness—to account for causes of an ordinary nature having such extraordinary effects. Some veterinarians believe farcy and glanders to be capable of being “bred” or generated in the horse’s system : if so, any common causation might prove adequate to excite their development ; and our position still holds good—that for causes of an ordinary or pure nature to be productive of the specific disease, they must operate on a system in which the *seeds* of that disease already exist, or in which there is present a susceptibility of some kind different from any existing in a healthy system, or even in one under any ordinary condition of disease or unhealthiness.

* Turn back to page 218.

SEAT AND NATURE OF FARCY.

FARCY may be said to have its seat in the *skin*, that of glanders being accounted to be the *aërial membrane*. In strict pathology, glanders and farcy together constitute one and the same disease of the lymphatic vessels and their glands; the disease originates in these vessels, and for a time confines itself to them; in the course of its progress, however, it extends into the contiguous tissues, affecting in one case the *cutis vera*, in the other the mucous lining of the air-passages, and it is in these parts respectively that the phenomena of farcy and glanders are exhibited. No wonder, therefore, that the appearances in farcy—the local symptoms—should differ so much as they do from those of glanders, and that the buds and ulcerations of the one should be found, in the course of treatment, so much more manageable or more “curable” than those of the other form of disease; or that one disease should be so much more dangerous to the animal affected, as well as to horses (in health) around him, than the other. Inflammation in the cutis is a different disease from inflammation in a mucous membrane—productive of different phenomena, and requiring a different (local) treatment: hence the apparently wide differences between two diseases essentially or in nature alike.

In general, in dissecting farcied limbs or other parts, as soon as we have cut through the thickened and indurated skin, we appear to have bottomed the disease—to have reached its depth or profoundest seat; the subcutaneous tissue everywhere around is infiltrated, apparently in a state of local dropsy, but of the farcinous disease the skin has manifestly borne the brunt. In cases, however, of inveterate or malignant farcy, in which the deep-seated as well as the superficial order of lymphatics have taken on disease, we meet with farcy-buds and pustules, and occasionally with abscesses of large and irregular dimensions, situated among the muscles.

Dupuy informs us he has met with “tubercles” (or farcy-buds) and farcy-pustules upon the mucous lining of the

alimentary canal; and Leblanc, so far as having witnessed one case of the kind, confirms this account. On the same authorities also we may state that the liver, the spleen, and the testicles, have all been known to exhibit farcy. In the case of disease of the *mucous membrane*, be it in the intestinal canal or in any other situation, to be consistent in our pathology, we ought to call the disease *glanders*.

IN NATURE farcy is identical with glanders: they are, let it be remembered, one and the same disease seated in different tissues and localities of the body; glanders being an affection of the mucous tissue, seated in the head; farcy one of dermoid tissue, appearing upon the limbs and body; both originating in disease set up in the lymphatic system.

WRITERS ON FARRIERY have regarded farcy as a disease of the blood-vessels, of the *veins* in particular; and considering that farcy cords take in general the same course which the superficial veins are seen to do, and that the knowledge these writers possessed of the lymphatic system amounted to little or nothing, we need not feel surprise at their running into so venial an error. SOLLEYSELL* informs us that the "*farcin* may easily be known by the knots and cords that *run along the veins*, and are spread over the whole body." And he describes "four kinds of farcin," to which he says "all the rest may be reduced;" and that "the second sort of farcin is accompanied with hard swellings, resembling ropes or strings, that run beneath the flesh and the skin, *along the veins* especially those of the thigh, neck, brisket, and along the belly."

A century later than the time of Solleysell we find the best English veterinary author of his day, GIBSON,† a *surgeon* as well as veterinary surgeon, still believing that "the true farcy is properly a *distemper of the blood-vessels*," notwithstanding he treats in the same work of the "distribution" and "use" of the *lymphatic vessels*. "When inveterate," he continues, "(the farcy) thickens their (the veins') coats, and common integuments, so as they become like so many cords, and these are larger or smaller in proportion to the size and capacity of the *veins* that are affected by it. It is seldom perceivable on

* Op. cit., p. 198.

† Op. cit., p. 257.

the arteries, because of their continual motion and pulsation," &c.

COLEMAN pronounced farcy to consist in "an inflammation and suppuration of the *lymphatic* vessels;" and assumed, that the disease had a predilection for the *superficial* to the exclusion of the deep-seated order of those vessels, the same as other diseases of the body had their peculiar seats. He considered farcy-buds to arise from effusions of adhesive matter into the canal of the lymphatic, distending the vessel in the intervals between its valves, which latter he regarded as insusceptible of the farcinous irritation; "for if," said he, "a diseased lymphatic vessel be examined, *perfectly sound partitions of membrane* will be found between the buds, which cannot be anything else *but the valves*."*

LEBLANC, however, with whose researches and opinions we have had reason, when on the subject of the pathology of glanders, to be well pleased, regards the farcy-bud as the result of *the coagulation of the lymphatic fluid* or *lymph*, accumulated within it in consequence of the obstruction in its incrassated condition the fluid (lymph) receives from the valves, to which accumulations are owing the well-known plumpness and rounded shape of farcy-buds. Still, Leblanc admits that the vessels themselves are "almost always" in a state of disease: he has found their coats thickened and opaque, their lining membrane frequently exhibiting red spots, ragged, adherent to the contained portions of coagulated lymph, and in places softened without any ulceration, or else altogether in a softened condition. This softening change in time pervades the other (thickened) tunics of the vessel, and even affects the contained clots of lymph, ending, at length, in points of ulceration, opposite to which the surrounding cellular tissue becomes at first tumid, afterwards solid and firm; lastly, soft, as the other parts have become. In the centre of the softened mass a little depôt of matter forms, *a pustule*, having its seat partly in the lymphatic vessel, partly in the cellular tissue, and separated from other pustules above and below it by the valves. In places where the skin is very thin—on the lips, nose, insides

* Coleman's Lectures on Glanders and Farcy, as contained in vol. iii of my Elementary Lectures on the Veterinary Art.'

of the thighs, &c.—Leblanc observes, farcy-buds are in general smaller than in parts clothed by thick skin. This, I imagine, is owing to the scantiness or density of the cellular membrane in such parts.

THE CHARACTER OF THE FARCY-BUD is well described by Rodet.* “Detach a moderate-sized farcy-bud of recent formation, and before the softening process has commenced in it, and cut into this firm, indolent, rounded, everywhere isolated, completely formed bud, and its interior will be found composed of a hard, fibrous, condensed, milk-white tissue, resisting the bistouri; and though exhibiting throughout, in certain cases, a homogeneous texture, is nevertheless, in other instances, found grooved and traversed by some sanguineous capillaries. At a rather later period than this, at the time when it commences growing soft in its centre, and is about to become adherent to the skin, and sometimes before it has adhered, we may observe (providing the recent internal process of liquefaction be not completed) that its circumferent parts still retain the white fibrous indurated texture which formerly constituted the entire bud, and that within its interior is enclosed a pultaceous matter of a yellow or a dirty white colour, or else slightly reddened. At length, when the process of softening is completed, and before it is converted into abscess, we find that within the bud several little morbid productions, united by laminae one to another (arranged in concentric layers), and resembling adventitious serous membranes slightly infiltrated, whose raw interior gives the appearance of ulceration to its inner surface), concur to form the walls of the abscess, enclosing a white, thick, homogeneous matter, whose consistence, varying a good deal, is at one time caseous, at another puriform, at another analogous to that of thick jelly (bouillie).”

The peculiar well-known spheroid shape of the farcy-bud, as well as that of the pustule which succeeds it, is proved to be owing to the existence of the valves within the lymphatic vessel, they preserving their integrity while the coats of the lymphatic are vanishing through absorption. Coleman said the valves were *insusceptible* of irritation and consequent in-

* Op. cit., page 215.

flammation from farcy, and alleged as one reason for this, their being structures organized in a less degree than the tunics of the vessel. In some cases—in such probably as would be regarded as unhealthy or ill-conditioned constitutions—we know that the valves, as well as the tunics, do however inflame and ulcerate or become absorbed; and that, in consequence, the farcy pustules run into each other, and by such communication lose their characteristic shape, lengthening into fistulous abscesses, well known to farriers under the denomination of “farcy pipes,” or spreading into abscesses of large and irregular shape, burrowing deep in the connecting cellular tissue.

THE SKIN—the *cutis vera*—undergoes changes very analogous to the thickening and induration of the farcy-bud. In the course of time it becomes enormously augmented in substance, remarkably white, and unusually tough and hard, cutting like so much white leather rather than skin, especially in the immediate vicinity of the buds; several of the more superficial of which, some that have become *pustules*, will be found embedded in its thickened substance. We, however, no sooner cut through the indurated cartilaginous-like cutis than we expose chains of farcy-buds and pustules, immediately underneath it, invested by cellular tissue full of infiltration of a jelly-like citron-coloured fluid, beyond which bed of effusion we appear suddenly to lose all vestiges of disease. To this, however, there are exceptions. In inveterate farcy the infiltration will sometimes be observed extending deep between the muscles, and every now and then abscesses, depôts of matter, of considerable volume, will be discovered buried among the fleshy structures. Nor do the bones, no more than the muscles, escape the ravages of farcy and glanders; we know how the turbinated and ethmoid and nasal and maxillary bones have suffered in malignant cases of the former disease; and we are assured by Dupuy and others, that many of the bones of the limbs and body have proved extensively diseased in horses that have for a length of time been afflicted with farcy.

TREATMENT OF GLANDERS AND FARCY.

VETERINARY surgeons are taunted with glanders being the *opprobrium* of their art—a bane for which they possess no antidote—and they feel the taunt to be too true to admit of reply : they reluctantly and sorrowfully and reproachfully condemn a noble animal, in the apparent enjoyment of health and strength, to slaughter, because he has a disease upon him, though it be seemingly only in his nose, for which they know of no remedy, and because that disease is likely to spread from him to other horses ; nay even, through possibility, to man himself. Although veterinary science, however, has hitherto failed in discovering any cure for glanders, it may certainly be said to have elicited a course of medical treatment which oftentimes proves of essential service in cases of *farcy* : why farcy, which we have found to be in nature nowise different from glanders, should be at times curable, and glanders in its acute and confirmed stages never so, will be pointed out when we come to consider their respective therapeutics. And though our art proves unavailing in the *removal* of glanders, yet have we sufficiently good reason to boast of the *prophylactic measures* it has devised and put into practice. This leads us to make a division of the treatment into prophylactic and therapeutic.

Prophylactic Treatment.

To form a judgment of the efficiency of our prophylactics we have no more to do than to institute a comparison between the existence of glanders and farcy at the present day and their prevalence in times past. The day was when, in almost any large horse establishment, certainly in most public horsemarkets, such as Smithfield and others, one was almost sure to meet with a glander or farcied subject : the metropolitan horse-slaughters' yards were never without them, and most loathsome spectacles the poor wretched creatures presented, tied up as they were for days together without food, breathing hardly and stertorously through their plugged-up nostrils, waiting their turn for the poll-axe. Where, however, in our own days—

thanks to the general diffusion and utility of the prophylactics we are about to mention—are we to look for such disgusting pitiable scenes as these?—nay, now-a-days, it is hard to know sometimes where to go to obtain glanderous matter for the purposes of experiment. Let us but for a moment pause to consider what the losses of large coach and post and job establishments, breweries and coal-yards, used to amount to annually through glanders and farcy, and compare those accounts with their present casualties from the same causes!—or let us turn over the horse statistics of our cavalry or ordnance! Frightful, to our own knowledge, have been such losses in our public departments; as nothing, compared with what they formerly were, are the same casualties at the present day.

That the principal excitants of glanders and farcy are *contagion* and the *miasm of the stable*, appears among veterinarians of our own day to be pretty universally admitted, other causes being but occasional or incidental. Coleman, indeed, shut contagion all but out from his causative agents, ascribing all the mischief to “the poisoned atmosphere of the stable.” He presumed the virus or poison of glanders to be “bred” as well as “diffused in an atmosphere rendered impure by repeated respiration and by effluvia from the dung, urine, and perspiration.” A confined atmosphere in a foul stable being the *fomes* of the miasm or contagion, the remedy for prevention became evident. It was not sufficient for a stable to be drained and kept clean; it was necessary that there should be a continual change of its atmosphere kept up—that the air which its inhabitants had once breathed, and which had become heated and carbonized, should not enter their lungs a second time. This was Coleman’s principle of proceeding in his prophylactic measures—this reasoning it was, supported by a host of facts, that laid the foundation of his grand scheme of ventilation; and the records both of our cavalry and ordnance will triumphantly show how successful the scheme has proved, to say nothing about the benefit private studs and establishments have derived from having, late though many of them did have, recourse to the same. Coleman’s plan of ventilation was to make apertures in the roofs of stables, or in the most elevated parts, and especially in the corners, of their side walls, through

which the heated and impure air might find escape ; as well as apertures in the lowermost possible situations through which fresh (pure) air might find ingress to replace what had escaped above. Sound, however, as Coleman's theory was upon general principles, it was not found in all situations to hold good in practice ; for wherever a current of air or a strong wind sets against stables, it will be found that even through the *upper* holes of that side air will rush in, while through the lower of the opposite side of the stable rarefied air will escape. Still, however, Coleman's general reasoning was sound and applicable. And as a proof of it, we know that he, in numerous instances, succeeded in rendering stables wholesome, which had been notoriously the reverse ; the consequence of which was the banishment, from such abodes, of diseases of the most malignant and fatal description, in particular of farcy and glanders.

That such were the facts, such the results, can be sufficiently proved by the veterinary annals of the army and ordnance departments. The only question for us, as professional men, to consider is, whether Coleman's premises and deductions in regard to the said facts were sound—whether, as he so confidently asserted, the evil *wholly* arose from what he called “a poisoned atmosphere,” *i. e.* an atmosphere in which a poison had been “bred,” or whether the atmosphere had not become “poisoned” through *contagion* ? Coleman's assumption that every horse, at the time he became an inhabitant of a stable of this description, was sound in constitution—free from the *seeds* of disease—could not be proved ; and since he did not believe that contagion could operate, save through *actual contact*, he took little or no heed of any such influence in forming his theory of the effect of ventilation ; but unhesitatingly ascribed all, as has been already stated, to the poison or miasm generated in the stable. Without any desire to detract from the benefits derived from ventilation, we cannot shut our own eyes to the good that has evidently resulted from a superior stable regimen, from a superior management altogether of horses in a state of domestication ; neither can we pass by without remark the great attention that has all along been paid to the immediate separation and removal of the tainted subject from his sound companions ; the very shadow of a symptom of glanders or farcy

(or of any other contagious or malignant disease) having been, with veterinary surgeons, sufficient to cause the instant separation of the patient; and this is a circumstance which alone we can entertain no doubt whatever has tended very materially to the prevention of the spread and multiplication of cases of glanders and farcy.

From these observations we gather that the prophylactics against the generation and spread of glanders and farcy, are, first, VENTILATION OF STABLES; 2dly, CLEANLINESS, in which is included the *draining* of them; 3dly, The immediate and complete SEPARATION OF THE SICK FROM THE HEALTHY. To enter here, farther than has already been done, into the subject of ventilation, would, if not out of place, occupy more of our space than we could possibly afford it; neither can we, nor perhaps need we, enter into any details of cleanliness, or draining, or paving: it seems right, however, to remark, in regard to the segregation of a horse having or suspected of having glanders or farcy, that his separation can neither be too early nor too complete: to satisfy every doubt respecting contagion, he should be placed at such a distance from his associates in health, and in such a situation that no *direct* atmospheric communication can exist between their habitations. And moreover, his pail, halter, bridle—even harness and saddle, too, perhaps—ought to be restricted to the patient's use, or not used among other horses until such time as they had undergone the necessary purification. Likewise the groom looking after the glandered subject should be careful not to allow himself or his clothes to become the medium of contamination between the diseased and the healthy. These precautions may, by some people, be thought to be strained beyond what experience has found to be requisite: I would, however, for my own part, rather run the risk of having an imputation of this kind cast upon me than suffer any doubt to remain lurking in my own mind of the full sufficiency of any prophylactic measures I might have recommended. In large establishments, where many valuable horses are stabled together, we can hardly exercise too much nicety and fastidiousness on the occasion of any contagious disease, and especially of such a one as glanders and farcy, breaking out amongst them.

Therapeutic Treatment of Glanders.

Having got our patient lodged in some secluded habitation, our next consideration is, what is to be done with him, or rather for him? Should his attack turn out to be *acute glanders*, death, through suffocation, will so soon end his days that it seems a pity the poor sufferer should be allowed to labour out his existence: indeed, humanity ought to forbid it, and at once blow the wretched creature's brains out with a pistol-shot. Leblanc says he has, on several occasions, performed tracheotomy for such subjects, but has failed in affording any permanent relief. And there is nothing that I know of that will, in any material or marked degree, ameliorate their horrid condition.

In the present state of our knowledge of the therapeutics of glanders, the only varieties admitting of treatment are the *sub-acute* and the *chronic*; the acute, as we have just seen, running its course too hurriedly and fiercely to admit of any check from medicine. In its less virulent forms, occasionally as subacute but oftener as chronic, the disease has been known to disappear under medical treatment, and oftentimes to the delusion of the director of that treatment, who has naturally inferred that his prescriptions had worked the cure, when in point of fact, as subsequent experience has proved to him, the patient has recovered under the influence of the *vis medicatrix naturæ*. Nevertheless, in one form or other, glanders has been the subject of treatment from the earliest times down to the present, every experimentalist varying his plan of procedure, directing it to the parts diseased or else to the system generally, in accordance with whatever notions he happened to entertain concerning the nature of the disease.

VEGETIUS, in his *methodus meudendi*, considered it necessary to *purge the head* of the horse, in order to rid it of its "stinking and thick humours;" for which purpose he prescribed a mixture of oil, adeps, and wine, and directed it to be poured into the nostrils; and further ordered, that *the horse's head should be bound to his foot*, with the intention that, as he stepped along, "all the humours might drop out."*

* Op. cit., at p. 253.

SOLLEYSELL, considering the state of medical veterinary knowledge at the time he wrote, manifests here, as in so many other instances, extraordinary sagacity and penetration. He tells us that, in glanders, by the use of "good remedies," a cure even *might* be effected "if the lungs were not already wasted;" adding, that "God alone can restore a consumed part." Although, however, he made use in his practice both of *injections* up the nose and of *fumigations*, and of applications as well both of the *actual* as the *potential cauteries* to the "kernels" under the jaws, and occasionally excised them—a practice he found afterwards to be of no effect—and although he administered internal "remedies" to boot, it is evident he entertained very meagre hopes of cure; for he warns us, that "when a farrier undertakes to *cure* a horse of the glanders, you may conclude that hardly he will be able to perform his promise, or that the disease is really not what you imagine it to be."*

LAFOSSE, finding the nose and sinuses of the head to be the locality of glanders, and concluding, from the absence in general of appearances of disease elsewhere, that the malady was confined exclusively to the head, "from thence," to use his own words,† "considered of a proper method of cure; and after a great many reflections, I concluded," says he, "in favour of the TREPAN; that, by the help of a syringe, one might inject proper and convenient remedies into the nose."—Doubting at first "whether the horse could bear the operation of trepan," fearful of the result of his experiment, Lafosse commenced the operation on one side only; afterwards, however, he performed it on both sides, and was "agreeably surprised to find that horses that had *holes cut through their skulls* preserved every sign of health"—and that the apertures he had made evinced "a good disposition to heal and grow up." A very few years of additional experience, however, evidently showed Lafosse the inefficacy of the trepan; for we find him, in a subsequent

* Op. cit., at p. 198.

† 'A Treatise on the True Seat of the Glanders in Horses; together with the Method of Cure.' By M. LAFOSSE, Master Farrier of Paris, and Farrier to the King's Stables. The translation and notes by H. BRACKEN, M.D., London, 1751.

publication,* calling to his aid, when “glanders is *confirmed*” —“emollient decoctions thrown up into the nostrils, carefully pushed into the frontal sinuses, and repeated thrice a day for a week ;” and likewise, “fumigations,” which would come into practice, he adds, “if their good effects were better known.” With his trepan and all its auxiliaries, Lafosse in the end finds himself forced to confess “there is no answering for the cure,” that depending “on the *stubbornness* of the disease ;” for as he appears now to have discovered, besides “confirmed glanders,” there are “*six other kinds* of discharges by the nostrils, of which *four are incurable*.”

BRACKEN and BARTLETT were both advocates for the trepan, praising Lafosse for his discoveries and efficient mode of cure : but GIBSON† had no faith in the remedies. “Glanders,” he said, was “so generally fatal,” he had no occasion to “spend much time in laying down any method of cure.” He scouts the notion of getting rid of the disease through “destroying the kernel under the jaw with the actual or potential cauter,” and so “cutting off the supply of matter that feeds the distemper ;” adding, that glanders is “rooted in the blood,” and therefore cannot be removed by any other than “*inward means* ;” which “means” he gives an account of in the narratives of the cure of two cases of glandered horses belonging to the “First troop of Guards.” These cases, however—one of which baffled all attempts for a period of six or seven months—as our author remarks on them, only “showed the difficulty and trouble of curing glanders, even where *the symptoms are favorable* ; for among the many glandered horses I have seen,” he adds, “perhaps *not one in fifty* was to be meddled with ; therefore I *should never advise anybody that has a horse* TRULY GLANDERED *so much as to attempt a cure*.”

Few of us now living can give wholesomer counsel than this. Let any person who professes to “cure” glanders but have his cases proved by three such simple tests as follow, and the results, even should they fail to undeceive him, will surely satisfy those who may be misled by his representations :—1st,

* ‘Observations and Discoveries made upon Horses,’ &c. By the Sieur LAFOSSE, Farrier to the King of France. London, 1755.

† Op. cit., at p. 257.

Let the cases be proved to be genuine or confirmed glanders ; 2d, Let such horses as appear to have been "cured" be kept or watched for such a length of time afterwards as will satisfy competent men that no relapse is likely to occur ; and 3dly, Let it be demonstrated that the "remedy" will take like good effect in all other cases of glanders and farcy, barring only such as, from organic disease of the lungs or other vital parts, or from extreme age or debility of constitution, cannot be expected to derive the same benefit from the antidote.

Supposing a veterinary practitioner called on to treat a case of glanders, it becomes his duty, to the extent within his power, to ascertain whether the case—supposing any doubt impend over it—be one of glanders or not. I have already observed that treatment for *acute* glanders is (unless we know of any specific) altogether out of the question ; therefore the case before us we will suppose to be either of a dubious subacute character, or, altogether chronic in its nature. The patient appears in excellent health and spirits ; indeed, were it not for the trifling running from his nose and the inconsiderable glandular swelling under his lower jaw, he would to appearance ail nothing whatever. It seems a pity and a shame to put such an animal to death. And, besides, he is "such a favorite"—"something *must* be done for him !" The first thing to be done, I repeat, is to ascertain if the disease really be *glanders*. Inoculation of another (valueless or condemned) horse, or of an ass, will probably set this question at rest. Or, the frontal and maxillary sinuses may be bored into and examined, through the introduction of a feather into their cavities, or by syringing of tepid water into them : should the feather return smeared with matter, or the water flow through the nostrils bringing matter along with it, in the absence of any known disease producing such a secretion within the sinuses, the case may be at once pronounced upon. Supposing the evidence to turn in favour of the discharge being of a glanderous nature, what steps are next to be taken by the medical attendant ? The utmost that can be said in favour of the prospect of a fortunate result is, that the annals of veterinary medicine contain several cases of recovery under treatment of various and different kinds, and that the patient in question, so long as the disease increases not

beyond its present mild form, may, it is just possible, add another to that number. But what is to be the *methodus medendi*? Shall we attack it as a *general* disease or simply deal with it as a *local* affection?—or shall we essay what can be done in these ways combined? Let us first consider

GENERAL TREATMENT. In respect to regimen I would have the horse comfortably lodged, well groomed, and well fed. I think it not only impolitic but dangerous even to disturb, in any material degree, that (good) health which he, to all appearances, is in the present enjoyment of. Supposing any local inflammatory action or fever that may exist not to be of a character—which in the subacute and chronic forms of the disease we do not expect to find it is—to require any anti-phlogistic treatment, I would not deplete or debilitate my patient: I would neither bleed nor purge him. And what medicine I gave, should be of a tonic or astringent character; *astringent*, so far as regards any action it might have on the mucous tissues: I say this because it will be found, when we come to examine the various “specific remedies” we have had recommended for the cure of glanders, that they mainly or wholly owe their anti-glanderous properties to their influence upon the secretions of these parts.

As well in other countries as in our own, have persons—veterinarians and others—come forward with “cures for the glanders;” and there, as well as here, have learned societies and colleges (not to mention the credulous public) been ready and weak enough to approve and reward such pretensions without waiting until the “discoveries” had been submitted to the examinations and tests of persons who were alone capable of appreciating them. In the last century the Royal Academy of Science vouchsafed their approbation to Lafosse for his discoveries of the seat, nature, and *cure* of glanders. In the present century, the Royal Society of Agriculture in France have publicly eulogised Professor Collaine, of the Milan veterinary school, for his successful practice against glanders, with *sulphur* as his specific; and our own Veterinary College have rewarded Professor Sewell for the same, with *sulphate of copper* for his specific. In later times still, in France, *chloride of sodium* (common salt) has received favorable notice from the

Royal Agricultural Society. It is hardly requisite to add, that, had any one of these "remedies" turned out to be curative of glanders, we should not, at the present hour, be painfully compelled, as for hundreds of years our ancestors have been, to doom unfortunate glandered patients to a premature and opprobrious death.

SULPHATE OF COPPER (*blue vitriol*) has had in our own country, for a great many years, a sort of established reputation among veterinary surgeons as a remedy for glanders and farcy. I believe that it was introduced into our "farcy ball" by the late Professor (Coleman); and, though he never ascribed to it any *specific* virtues, the result was, that a good many of his pupils—my father among the number—were in the habit of administering it in glanders and farcy, on the belief of some supposed benefit derived from its use, in all cases where medicine was given, save such as were devoted to experiments, with some new remedy or untried medicine. Professor Sewell, however, has not hesitated to declare it to be, administered in a *fluid* instead of a solid state, "a remedy for glanders." His words are—"Although there are practitioners that condemn this, more bear me out. I have a horse that has been cured now (1827) four years. Many of the profession have attempted to accomplish this by medicine in a *solid* form; but the same quantity which, so given, would inflame the stomach and bowels and destroy the animal, may be exhibited innocuously *in a state of solution*; and it succeeds best when the solution contains some mucilage, as gum arabic."* As a general dose, Mr. Sewell recommends six drachms of the salt in two or three pints of water thickened with mucilage. Mr. Youatt thinks—and I quite agree with him—that this is much too large a dose: from half-a-drachm gradually increased to two drachms, and given twice a day if required, being a much likelier dose to have a tonic operation, and, in the words of Mr. Youatt,† "sustain the system against the insidious effects of this long-continued irritation; or excite another and healthier and more powerful action, and before which the other must succumb."

* Mr. Sewell's Introductory Lecture in 'The Veterinarian' for 1828.

† See Mr. Youatt's Lectures in 'The Veterinarian' for 1832.

And, moreover, Mr. Youatt thinks that, while the copper answers this end, it "has a peculiar local determination to the Schneiderian membrane;" and, also, that its effect "in healing abrasions and arresting nasal gleet is undeniable." The following case, sent me by my relation, Mr. Charles Percivall, exhibits all the appearances of recovery from the employment of sulphate of copper in solution :—

"While I was (veterinary surgeon)," says my cousin, "in the Enniskillen Dragoons, a squadron of the regiment, then stationed in Ireland, became detached for upwards of a fortnight; during which time the horses were cantoned in filthy close stabling, wherein glandered horses were known frequently to have stood on former occasions, glanders being no uncommon occurrence in this part of the country. On the return of the squadron to head-quarters, one of the finest horses belonging to it—in perfect health at the time he went out—was brought to me on account of a copious discharge from his off nostril, accompanied by extensive ulceration upon the same side of the *septum nasi*, and tumefaction of the off submaxillary lymphatic glands. He was immediately shut up in a box appropriated for contagious subjects, bled (being in high condition), and had his glands blistered; and was ordered to take, daily, half an ounce of sulphate of copper in solution, a dose that was afterwards increased to an ounce. On the ninth day, being off his feed, the medicine was discontinued. On the eleventh it was resumed. On the fifteenth, for the same reason as before, it was again omitted. On the seventeenth the dose recommenced with was ʒvj, which he continued to take with but few omissions until the fifty-seventh day. By that period the ulcers, which for some time past had been gradually growing cleaner and healthier, were quite healed; and the discharge from the nose, which likewise had been for some time diminishing, had also ceased. Apprehending, nay, looking for a relapse, the animal was still detained in the infirmary box, and kept there for two months longer before he was allowed to rejoin his troop. Twelve months afterwards my cousin left the regiment; up to that time the horse continued free from disease."

THE SULPHATE OF IRON is a favorite medicine with Mr. Turner, of Regent Street. He prescribes it, "not in nauseating, overwhelming doses, but dissolved in the water (the horse drinks) in his bucket suspended in his box, so that the patient may drink a little at a time, and as often as he pleases. Mr. Turner informs us, that the horse not only soon becomes habituated to the brackish flavour of the iron, but even prefers the drugged beverage to his ordinary drink.*

* From Mr. Youatt's Lectures, 'Veterinarian' for 1832.

CANTHARIDES, as a medicine possessing singular efficacy in glanders, are in great estimation with Mr. Vines. "The medicine I have found of the greatest service," writes this author* (in his chapter on the "Treatment of Glanders and Farcy," Section, "Remedies to be employed") "whether alone or in combination, has been *cantharides*. They appear to me, when given internally, to act on the system in two ways:—first, by stimulating the vascular surface of the inner coat of the stomach and intestines, thus promoting the greater formation as well of gastric juice as of the other fluids; and also increasing the appetite and digestion, and consequently forming a greater quantity of chyle, or new white blood. Secondly, by absorption, their active properties being taken into the circulation, and producing in a very short time a *material change in the mucous membrane and ulcers of the nose*, as well as in the ulcers of the skin." Mr. Robertson (Mr. Vines informs us), a surgeon, has published an excellent work on the efficacy of cantharides for gleet or affections of the urethral membrane, and for unhealthy sores in the skin; and that he (Mr. R.), twenty years ago, recommended its use at the Veterinary College, where it failed, Mr. Vines says, "from its having been given *in too large doses* (drachms)." * * * The principal precautions to be attended to in using cantharides internally in the horse are, not to administer them either at the *commencement* or *early stages* of inflammatory disease, or in *too large quantities for a dose*, or *too frequently to repeat them*. For they are only proper to be used, and ought not otherwise to be administered, but when the symptoms of disease are of a *chronic*, or slow form and nature; that is, when the system is either in a *state of debility*, or approaching to it," &c. * * * The doses are—"for a middle-sized saddle-horse, four grains; for a large carriage or dray horse six grains, in fine powder," made into a ball, with ginger, gentian, &c. "A ball may be given every day, or every other day, either in the evening or morning." Should the horse's appetite amend, and he appear going on well, after a week, ten days, or a fortnight, the dose may be augmented a couple of grains; but after another like interval,

* Op. cit., at page 215.

the medicine had better be suspended for a few days or a week, when the first doses may be resumed, and after a week increased to ten and twelve grains.

IODINE (the mineral) has been exhibited by myself in farcy and glanders, but with no sign of benefit from it. The iodide of potassium has been given in very large doses, varying from a drachm to an ounce (not, however, as a remedy for glanders), by Professor Dick, but with no appreciable effect, save an unusual indifference about drink. Inefficacious, however, as iodine has proved by itself, in combination with copper, in the form of the

DINIODIDE OF COPPER, it appears to have become, in farcy in particular, of indubitable service. For the introduction of this medicinal agent into our pharmacopœia we are indebted to Mr. Morton, Professor of Chemistry at the Royal Veterinary College. "The well-known fact," says Mr. Morton, "that the salts of copper rank among the most valuable tonic agents for the horse, and that all the mineral tonics, in order to produce their effects, are taken up into the circulation, coupled with the equally well-known influence of iodine on the absorbent vessels, first led me to think that a combination of these agents would be of service in farcy. The kindness of my friends, Professor Spooner and Mr. Daws, enabled me to put the subject to the test of experiment, the result of which fully confirmed my expectations. Since then I have received numerous communications bearing testimony to the benefits derived from its employment, so that it has now become an established article of the veterinary materia medica."—"It has been found of service in farcy, chronic œdematous enlargement of the legs, and those affections simulating glanders. It may be given in doses from ʒj to ʒij daily, combining it with the root of gentian and some carminative, as pimento or Cayenne pepper. Cantharides in small doses may be advantageously combined."* From some cases related by Mr. Lord, V.S., of Parsons Town, Ireland, it would appear that the iodine and copper pharmaceutically

* 'Manual of Pharmacy for the Student of Veterinary Medicine.' By W. J. T. Morton, Lecturer on Veterinary Materia Medica, 3d edition, 1844.

united are equally efficient with the chemical preparation. A working horse, old and out of condition, whose symptoms were "evidently farcy, terminating in glanders," was brought to Mr. Lord on the 12th of August, 1842, who made up for him a dozen and a half powders, composed of the sulphate of copper in combination with iodide of potassium, ordering one to be given daily, and that the patient should have as much clover and vetches as he would eat. He saw nothing more of his patient until the 4th of September, when to his utter astonishment, the poor man (his owner) came, leading his horse, which was as well as ever: "the ulcers in the nostrils, the discharge and the (farcy) buds, having quite disappeared."* Passing from the accounts of others to

THE RESULTS OF MY OWN OBSERVATION AND EXPERIENCE, I would it were in my power to present my reader with an antidote as effectual as our prophylactic measures have proved against the horrible and fatal disease whose causes and nature we have been investigating. Few men in the veterinary profession have, perhaps, had greater opportunities than myself afforded them of making observations and experiments on cases of glanders and farcy; all, however, I regret to be forced to add, has turned to little amount—glanders, *confirmed glanders*, has baffled every effort. What the practice I enjoyed under my father, who was for thirty years the Senior Veterinary Surgeon to the Ordnance, and had the superintendence of one of the largest horse infirmaries in the country, an establishment that received weekly official visits from the late Professor Coleman—I say, what this practice amounted to, may be best learnt by inspection of the subjoined abstract from the Sick Registers of the infirmary, including a period of eight years—

* 'Veterinarian' for 1842.

ABSTRACT OF CASES OF GLANDERS AND FARCY, FROM 1810 TO 1818.

Year.	Disease.	No. of Cases Admitted	No. Cured.	No. Re- lieved.	No. Died.	No. De- stroyed.	Totals in each Year.
1810	Glanders	31	3	1	1†	26	45
	Farcy-Glanders	3	—	—	1	2	
	Farcy	11	5	6	—	—	
1811	Glanders	31	3	4	2	22	43
	Farcy-Glanders	6	2	—	—	4	
	Farcy	6	2	4	—	—	
1812	Glanders	25	2	—	6	17	31
	Farcy-Glanders	2	—	—	—	2	
	Farcy	4	1	3	—	—	
1813	Glanders	34	1	2	5	26	59
	Farcy-Glanders	11	1	1	4	5	
	Farcy	14	3	10	1	—	
1814	Glanders	31	4	3	1	23	66
	Farcy-Glanders	8	—	1	—	7	
	Farcy	27	6	17	1	3	
1815	Glanders	19	4	2	—	13	44
	Farcy-Glanders	11	—	2	—	9	
	Farcy	14	6	8	—	—	
1816‡	Glanders	9	1	—	—	8	11
	Farcy-Glanders	—	—	—	—	—	
	Farcy	2	—	1	—	1	
1817‡	Glanders	—	—	—	—	—	1
	Farcy-Glanders	—	—	—	—	—	
	Farcy	1	1	—	—	—	
1818‡	Glanders	4	1	—	—	3	7
	Farcy-Glanders	2	—	—	—	2	
	Farcy	1	—	1	—	—	
General Totals . .		307	46	66	22	173	307

* Some of the "relieved" cases of farcy were returned "incurable."

† This horse died from pneumonia.

‡ The decrease in these three years was owing to the reduction of the army after the battle of Waterloo.

N.B.—Several of the cases of glanders here set down as "cured" and "relieved," stood entered on the register as "*incipient glanders*."

In the horses whose cases are enumerated in the foregoing tabular statement, glanders and farcy presented itself in all its forms, phases, and stages, and the patients, in by far the majority of instances, were brought into the infirmary immediately any sign of disease presented itself: there was, consequently, every advantage afforded for treatment, and treatment of every kind and mode that could be devised was, at the suggestion either of Professor Coleman or my father, sometimes of myself, put fairly and fully to the test, for the most part under my own daily, and on many occasions hourly, visits to the patients. The following medicines were tested, all of them as internal remedies, some few externally as well:—Preparations of mercury, arsenic, copper, iron, lead, zinc, silver, antimony, barytes; manganese, sulphur, ammonia, fused potash, nitrous and prussic acids, chlorate of potash; aconite, belladonna, cantharides, catechu, cayenne pepper, cinchona, and oak bark, yew leaves, copaiba, balsam, cocculus indicus, cubeb pepper, digitalis, elaterium, euphorbium, gamboge, hellebore, hemlock, henbane, mezereon, opium, snake root, stavesacre, sumach, stramonium, tobacco, valerian, wormwood.

Among the mineral substances experimented on, *barytes* commanded our greatest attention. Indeed, at one time, so sanguine were our expectations concerning it that I drew up a paper on its efficacy in glanders:* as with other asserted “remedies” and “cures,” however, subsequent experience showed the apparent success derived from its use to be incidental or circumstantial; and now it stands with me much, perhaps, in the same estimation in which the sulphate and the diniodide of copper and cantharides stand with their respective advocates.

Among the vegetable productions, *stavesacre*, the *balsam of copaiba*, *cubeb pepper*, and *cayenne pepper*, obtained the most favorable reports. It was evident, however, that the apparent—indeed, in some cases resembling nasal gleet, actual—benefit accruing from the use of these medicines was ascribable to their well-known action upon the mucous surfaces: in fact, it was from their acknowledged efficacy in gonorrhœa in the human subject, that the three latter of these (the *copaiba* and the two

* Which paper was read, in the year 1824, to the Veterinary Medical Society at the Veterinary College.

peppers) were prescribed in cases of glanders. And, to a certain extent, they were found to answer our expectations. I subjoin some cases of recovery, some of amendment, from glanders—I will not say of “cure”—under the administration of these four last-mentioned agents:—

Recovery under the Use of Barytes.

CASE I.—*July* 1816. Black gelding, seven years old, in good condition. Farcy in near hind leg; a little flux of a muco-puriform nature from the near nostril, and a small ulcer upon the Schneiderian membrane; submaxillary gland swollen. Chloride of barium (muriate of barytes) \mathfrak{z}_{ss} , made into a common-sized ball by the admixture of meal and molasses, increased to \mathfrak{z}_{iss} daily. At the end of twenty-one days the patient was discharged “cured.”

CASE II.—*June* 1817. A brown mare, seven years old, in fair condition. Flux from both nostrils; one ulcer apparent within the off nostril, and two within the near. Chloride of barium \mathfrak{z}_{j} , increased to \mathfrak{z}_{iss} , in ball as before, daily. Took the medicine for sixty-eight days. Discharged “cured.”

Re-admitted in September, 1817, with muco-puriform running from both nostrils, and tumefied glands, but no ulceration. Chloride of barium \mathfrak{z}_{j} , increased by degrees to \mathfrak{z}_{ij} , daily, for twenty-five days. Discharged again; but admitted for the third time in the following month (October) for farcy in the off hind leg. Took the medicine again for seven days. Discharged “cured,” and went away out of any farther cognizance.

CASE III.—*August* 1818. Chesnut gelding, seven years old, in low condition, having a foul discharge from the near nostril alone, with tumefied gland. To this horse was given the oxyde of barium (*olim*, the pure or caustic barytes), in doses of \mathfrak{Oj} and \mathfrak{O}_{iss} . Latterly, he took the liquor of chloride of barium (the solution of the muriate of barytes). Altogether, he took the medicine for seventy-one days. Discharged “cured.”

CASE IV.—*September* 1818. A brown horse, in health, was inoculated with matter procured from the horse-slaughterers’ at Cow Cross, for the purpose of producing glanders. On the fifth day afterwards two large ulcers made their appearance within the near nostril (in which he was inoculated), and there was muco-puriform discharge from it, and adhering to it. The gland of the same side was swollen, and there was a nodous cord of tumefied lymphatics, as large as a person’s wrist, running from the affected *ala nasi* along the side of the jaw into the gland. This horse took the oxyde of barium in doses of \mathfrak{Oj} and \mathfrak{O}_{iss} during thirty-two days, at the expiration of which period he was sent away “cured.”*

* This horse’s case will be found related, *at length*, at page 221.

Recovery and Amendment under the Use of Stavesacre.

CASE I.—*June 1813.* A bay horse, five years old, in good condition and of apparently sound constitution, having the submaxillary lymphatic glands upon both sides enlarged, with two small ulcers and one large and spreading, within the near nostril; none visible within the off. He took stavesacre seeds in doses of ʒij, daily, augmented to ʒj, four times a-day, for thirty-one days, and was then discharged, apparently free from disease.

CASE II.—*June 1813.* A black horse, fourteen or sixteen years old, has his submaxillary lymphatic glands swollen on both sides; one large and very foul ulceration, and three small ulcers, visible upon the near side of the *septum nasi*; also some ulcerations high up, and consequently less distinct, upon the off side. Not a great deal of discharge from the nose, and no farcy. Took stavesacre seeds, commencing with half-ounce doses and ending with ounce doses, repeated four times a-day. Was taken away on the seventeenth day of his treatment, by his owner, in consequence of the disease having disappeared from the off side of the nose, and being in an evident state of amendment upon the near side, and the glandular enlargements under the jaw having subsided into a state of general thickening, such as is left after the repeated application of blisters.

CASE III.—*July 1813.* A black horse, rather low in condition, but in apparent health, excepting that he had enlargement of his off submaxillary lymphatic gland, and had four superficial ulcers, about the size of peas, visible upon the same side of the *septum*, high up, commenced with taking an ounce of the seeds of stavesacre three times a-day, and continued the medicine for twenty-four days, latterly taking two ounces morning and evening. The disease, during the second week and part of the third week, seemed diminishing and leaving him: it relapsed, however, and became more virulent than before.

Recovery under the Use of Balsam of Copaiba.

CASE I.—*May 1826.* A bay mare that had a copious defluxion from the off nostril, with a swelling of the submaxillary gland of the same side, nowise interfering with her general health, took Cayenne pepper for nine days, and left the infirmary "cured." In the October following she returned with the same kind of discharge, but now from the *near* nostril, and accompanied by fetor and swelling of the glands of the same side. On this occasion had administered to her half-ounce doses of the copaiba balsam, made into balls with *farina*, thrice a-day. On the ninth day from commencing the balsam her discharge had ceased, and with it had gradually subsided the submaxillary tumefaction. On the fourteenth day she left the infirmary "cured."

CASE II.—*August 1826.* A bay horse, low in condition, was admitted for "catarrh," for which, along with other treatment, he had been rowelled under

the jaw. So long as the rowel continued in full action the discharge from the nose diminished, but returned as soon as the rowel was taken out. There seemed to be something besides a mere catarrhal condition of the pituitary membrane, and it was determined to try copaiba in the case. Half-ounce doses were given daily for thirteen days, when the patient was discharged "cured."

Recovery under the Use of Cubebs Pepper.

CASE I.—In *October*, 1826, a brown horse, four years old, and of apparent healthy constitution, was admitted with "incipient glanders and swelled hind leg." The swollen limb, however, was afterwards found to have arisen from injury. There is a tolerably profuse discharge from the near nostril, and a lobulous tumefaction underneath the jaw, on the same side. He was ordered to take half an ounce of cubebs pepper, made into a ball with molasses, three times a-day, which afterwards was increased to an ounce, though the medicine was every now and then discontinued for a day or so, on account of the appetite failing. Altogether, he continued taking the pepper for a month, during which time the nasal discharge varied much, being at times little and then a good deal again: in the end, however, it became so trifling, and the diminution of the glandular swelling was such, that the patient was discharged "cured."

Recovery and Amendment under the Use of Cayenne Pepper.

CASE I.—*May* 1826. The same (bay) mare that afterwards, in consequence of relapse, took the cubebs pepper, on her first admission, which was on account of a copious discharge of healthy-looking purulent matter from her nostril, with tumefaction of the submaxillary gland of the same side, took Cayenne pepper, in drachm doses, twice a-day, and at the same time had the tumour under the jaw blistered. On the eleventh day her nose appeared clean, all discharge having ceased, and the tumefied gland much diminished. The medicine, however, was continued for a week longer; and then the mare left the infirmary "cured," there remaining only some trifling enlargement under the jaw.

CASE II.—The black and grey cart-mares, the property of Mr. Selby, of Wilmington, in Kent, whose cases are, in so far as regards their origin, given at page 226, both took Cayenne pepper, commencing with two-drachm doses morning and evening, which were afterwards augmented to four drachms twice a-day, and, instead of being made up with *farina* and molasses, were compounded of *farina* and copaiba balsam. The black mare, although confirmedly glandered, received so much temporary benefit from the medicine—the nasal ulcerations healing under the influence of it, and the nasal flux ceasing—that she went to work again, appearing to all to be "cured." She, however, experienced relapse; and in the end was, together with the grey mare who had also taken the pepper, but with less benefit, put to death.

The foregoing cases, which have been selected from a large collection on account either of their favorable progress or issue—the very same medical treatment having in as probably great a number proved of no avail—have not been introduced here with any view of showing, or inducing anybody to imagine, that the author either *has* cured or *can* cure glanders: at the same time, such as they are, they are ready to be brought forward in support of his pretensions to the “discovery of a cure” for glanders being about as valid as those of individuals who have received either approbation or reward on account of such “discoveries,” and not a whit more valid or worthy of consideration: the short and naked truth being, that the *cure* of glanders is hardly more advanced than it was in Lafosse’s or even Solleysell’s time. Horses have got rid of the disease under a very great variety of treatment, and on occasions when no treatment whatever has been employed; and the cases of recovery on record are sufficiently numerous to encourage us, under certain favorable circumstances, to make fresh experiments.

Whatever medicine we may choose to prescribe—and, as I said before, those of a tonic nature that possess, either in themselves or are combined with others that have, some influence upon the mucous surfaces, are found in general to hold out best promise—there can be no doubt but that the cure may be assisted by injections, if not by fumigations.

INJECTIONS UP THE NOSTRILS AND INTO THE SINUSES OF THE HEAD I have repeatedly put into practice, sometimes with good effect, sometimes with no good result, rarely with any permanent benefit. The injections I have used have been principally such as are either caustic, escharotic, or astringent, in their nature. I have syringed up the nose both caustic and escharotic solutions of bichloride of mercury, nitrate of silver, sulphate of copper, zinc, &c.; and such astringent lotions as solutions of alum, infusion of oak bark, &c. &c.

CREOSOTE, in human medicine, has received a high character as an injection. Dr. Elliotson says, that, by the sedulous injection of it in solution up the nostrils, he succeeded in removing all the symptoms of a case of chronic glanders in a few weeks. And since, Mr. Ions, V.S., Waterford, has recorded

an extraordinary case, in the person of his own son, in confirmation of the good effects of creosote. His son had been unwell from "a severe cold," attended by swollen tonsils and a small sore within the right nostril. While in this state he had occasion to examine a horse with acute glanders. The horse snorted his nasal discharge in his (son's) face. He wiped it with his handkerchief. This was followed by his feeling very unwell, his nose becoming obstructed through a profuse ropy glairy discharge, and his right eye slightly affected. Next, a large ulcer appeared upon the nasal membrane. The disease soon assumed a most alarming character. Mr. Ions urged the trial of creosote. It was conceded to. An ointment, composed of one drachm of creosote and seven of lard, was ordered, the slightest application of which produced such agonizing pain that it was immediately discontinued. Mr. Ions was determined it should be persevered with. There was now profuse nasal discharge having a most offensive smell, and, to all appearance, universal ulceration with constitutional symptoms indicative of approaching death. Mr. Ions added two minims of creosote to an ounce of water, and injected the mixture up the nose. After the third injection almost a magical effect took place: the discharge all but ceased, and two days afterwards the ulcers commenced healthy action, and went on rapidly improving. They lost their chancrous character, and assumed a healthy granulating aspect. His diet was nutritious, but no solid food was allowed him. "He drinks a tumbler of good ale every day, and yesterday rode for an hour."*

Supposing the disease to be seated within the nasal meatus, there is no more effectual way of applying the injection than through the nostril, with a syringe having a flexible tube of some length affixed to its nozzle, which tube may at pleasure be introduced either into the lower or upper meatus, and carried far up the nose or not, according to circumstances. Should it be our object to inject the sinuses, those cavities, of course, must be opened either by means of a small trephine or a bone-gimlet: injections into the frontal sinuses will run into the

* 'Veterinarian' for 1843.

nasal and maxillary sinuses, and from the latter find exit through the middle meatus of the nose, with the exception of some small quantity which will, in the ordinary position of the head, lodge within their cul-de-sacs.

FUMIGATIONS, I have no hesitation in saying, are less beneficial as topical applications to the ulcerated surfaces within the nose than injections. I have frequently used chlorine and other gases, as well as the fumes of nitric acid, the nitric oxyde of mercury, &c., but cannot say I have seen any decided good arise from them. The great use made of fumigation in such cases as glanders and farcy—and it is a highly important one—is as a means of disinfecting or purifying stables or other places which may have been inhabited by horses having such contagious diseases. “As a fumigating, disinfectant, and antiseptic agent, chlorine,” says Mr. Pereira,* “stands unrivalled.” * * “For destroying miasmata, noxious effluvia and putrid odours, it is *the most powerful agent known.*” * * “The best method of fumigating a large building is that adopted by Dr. Faraday, at the General Penitentiary at Millbank. One part of common salt was intimately mixed with one part of the black or binoxide of manganese; then placed in a shallow earthen pan, and two parts of oil of vitriol, previously diluted with two parts, by measure, of water, poured over it, and the whole stirred with a stick. Chlorine continued to be liberated from this mixture for four days.” We could hardly devise a cheaper, readier, and more effectual process for the purification of infected stabling than this.

COUNTER-IRRITATION, in my hands, has never proved of much avail in glanders. Some veterinarians advise us to introduce setons into the face, along the sides of the nasal bones; others, to blister the skin covering those parts: for my own part, I have found little or no relief conferred by either one or the other.

THE ENLARGED SUBMAXILLARY LYMPHATIC GLANDS may, however, when they come to lose their heat and tenderness, be blistered with considerable benefit, or they may be rubbed daily with iodine ointment. On their first appearance, and so

* ‘Elements of Materia Medica,’ by Jonathan Pereira, F.R.S. & L.S.

long as they continue hot and tender, we cannot do better for them than confine a folded piece of linen cloth, wetted with cold water or some refrigerant lotion, upon them, which may easily be managed by attaching it above to the throat-latch of the halter, below to the nose-band.

COOL AND PURE AIR has appeared to have, in some instances, a restorative or curative influence on glandered horses. Persons unwilling to have their horses destroyed from the circumstance of their general health and condition being evidently so good, have come to the determination to turn them to pasture by themselves, there to "take their chance;" and on occasions the results have proved favorable. Mr. Youatt gives an account of some cases so left to Nature, in which, he says, he was "half-deceived, and willingly so." The opportunity, however, was given of subsequently tracing most of them, and the following proved the result:—"The predisposition to the disease remained; possibly the very disease itself in an insidious form. In less than six months the discharge again appeared; the glands enlarged, and became once more adherent; chancre soon followed; glanders became fully re-established, and in a worse form than before; the malady speedily ran its course, and they (the patients) died."*

Therapeutic Treatment of Farcy.

While glanders has in all ages been regarded as an incurable disease, or as one from which the horse recovered—whenever he did happen to do so—more through the agency of the *vis medicatrix naturæ* than from any medical treatment he might have received, farcy, on the contrary, has been viewed, in certain of its forms and stages, as a disease susceptible of cure. It may at first appear strange that two such opposite opinions should be entertained concerning the curability of two diseases admitted in nature to be identical: when we come, however, to reflect that one has *dermoid* tissue for its seat, the other *mucous*, and that to the locality of the one we have free access, while the other remains concealed from our view, and for the most part is out of the reach of surgical means, any surprise we may have

* Mr. Youatt's Lectures.

felt will, probably, in a great measure cease. In any case of ordinary disease, every medical man is well aware how much easier it is to get a cutaneous sore to heal than one having for its bed secreting structure ; how much more disposed the latter is to spread, to become what surgeons call *phagedenic*, than the former. Furthermore, should an ulcer in the skin acquire any unhealthy action or aspect, we can correct its morbid tendency by destroying its surface either by some escharotic application or by the actual cautery, and by such means create in its place a healthy granulating surface ; but, should an ulcer deep-seated within the recesses of the nose take to chancreous spreading, in the first place how can we obtain any knowledge of its existence save through the quantity or quality of the nasal discharges?—and in the second, how are we to become acquainted with its exact situation?—and supposing this were possible, how are we to be sure of conveying our dressings upon it ? The very circumstance of its concealment within the convolutions of the nasal *meatus*, clogged and obstructed as those passages often are by the collected inspissated discharges, must be adverse to its healing ; since in the skin we always find ulcers do the best whose surfaces are left exposed to the influence of the air.

Mr. YOUATT's pen, I find many years ago, was engaged in solving the same question ; and as this gentleman's solution differs somewhat from mine, I shall make no apology for introducing it here :—"Glanders," says this author, "*a simply local complaint*, bids defiance to all our means and appliances ; yet when the virus has spread through the frame, and affected the greater part or the whole of the absorbent system, it is occasionally manageable. It is the very fact of its *spreading* that enables us to account for this. When it (the disease) is simply local, all its virulence is concentrated on one small surface, and no medicine can be brought to bear with sufficient power on the plague-spot ; but, when it begins to spread, and before the tissues which it now involves are too much injured and disorganised by its poison, its intensity is diminished. As inflammation of almost every character becomes diffused, it less powerfully affects the individual portions over which it spreads ; it is diluted—lowered : and now, as it becomes in some

degree constitutional, it may be attacked with greater hope of success.”*

So far as relates to the *constitutional* nature of farcy—it being in that respect identical with glanders, or rather one and the same disease as glanders—it is no more curable than glanders itself is : when we say we have “cured” a case of farcy, we mean we have succeeded in driving back or away the *local* disease ; we have subdued the inflammation, reduced or dispersed the buds and swellings, and healed the ulcers—in fact, rendered the animal fit to resume his work ; and so long as his constitution remains unaffected by the virus, and no fresh eruption makes its appearance, the horse may continue at work, and appear as though he were cured—if not in reality so. It must, however, be borne in mind—at all events, for some considerable time afterwards—that a relapse is not an unlikely occurrence, and that it is possible, if not probable, for him, at some future period, to end his days through glanders.

In the absence of any internal remedy which will act as a specific against farcy—counteracting, neutralizing, or expelling the virus—we have recourse to remedies of an ordinary kind, and place a good deal of dependence upon such as are local or topical in their operation. In so far as inflammation constitutes a leading feature of the disease, there can be no doubt but that an antiphlogistic plan is proper at the commencement of an attack of farcy. When a horse is brought with one of his hind limbs enormously swollen, hot and tense, and tender to pressure, and evincing evident pain and lameness, no veterinarian of any experience would hesitate a moment to bleed and purge. Could blood be drawn from the farcied limb, there can be no question about its being preferable to general bloodletting, as well on account of the better effect it would have on the limb as on account of the saving of strength to the animal, constitutionally ; since, however, this cannot in the horse be put into practice—leeches and cupping-glasses proving inapplicable, and opening a vein in the diseased parts being highly inadvisable—we are forced to abstract blood from the neck or some remote part, to have an effect produced on the diseased limb through the medium of the system ; and this is a great disadvantage

* Mr. Youatt's Lectures, 'The Veterinarian' for 1832.

we labour under, because while by the reduction of the constitutional powers we are benefiting the diseased part, we are, perhaps, thereby doing injury to the general system. The beneficial effect that bloodletting does commonly have in a recent attack may be seen by a perusal of the case—an ordinary one—of the Colonel's charger;* in which it will be observed that, notwithstanding he was purging at the time, and it was a week after the disorder had shown itself, a corded swelling arose in his thigh, which was put back by bloodletting, and a second and a third time repulsed by a repetition of the bloodletting; although in the end, the swelling still returned and proceeded to suppuration and ulceration. Bloodletting, therefore, is certainly, in the early stage, the most likely means of bringing about *resolution* of the farcy-buds; and though we may fail in this object, still will the loss of blood often be found to retard or stay their progress, at all events for some time, and so, perhaps, render the attack milder than otherwise it would have proved. In acute cases, however, do what we will, and do it when we may, it too frequently turns out that no benefit results from our remedies: the disease has constitutionally set in, and will run its course in spite of us.

WALKING EXERCISE is, in general, an indispensable accompaniment to any plan of treatment we may adopt. When the patient's limb is in the frightfully tumefied condition that has been described, and which it will be certain to run into should the animal be kept standing still, nothing so much assists the operation of medicine, and along with it proves so influential in reducing the tumefaction, as slow and steady walking exercise perseveringly kept up, and repeated, for an hour or half-an-hour at a time, twice or thrice, or four times a-day, according to circumstances. With a view of furthering this end, the patient may be placed in a roomy box: however capacious his apartment may be, it is seldom he feels disposed to move in it; but stands for ease in one place, never stirring his tumid painful limb but when compelled to do so.

THE DIET, during the inflammatory, swollen, tender, and irritable condition of the farcinous parts, and so long as any febrile disorder of consequence reigns in the system, must be a

* Given at pages 230 and 231.

low one : the febrile stage, however, once past—once the suppurative action commenced, the diet should be changed for a generous one, and the horse at the same time be well groomed: I am convinced that, no more in farcy than in glanders, is it prudent, after the first violence of the inflammation is past, to let the patient live low, or suffer him in his stable-management to go neglected. His general health must, if possible, be maintained.

MEDICINE.—After the first brisk dose or two of cathartic medicine, supposing we still deem it advisable to occasionally clear out the bowels—which we certainly shall do, so long as inflammation continues to harass the diseased parts, or whenever relapses occur—I prefer giving divided doses of cathartic mass in combination with diuretic mass. A simple and effectual formula is the common one of half-an-ounce of each mass, repeated every twenty-four hours, until the bowels shall have fully responded : the second ball not always accomplishing this—the third, generally.

Cathartics having been carried as far as is deemed expedient, the question presents itself—what is the next step to be taken? This is an important question ; at the same time one that admits of such variation in the professional answer to be given to it, that I will venture to affirm, the inquirer shall go to a dozen veterinary surgeons and receive for answer the names of as many different remedies. For instance, if he were to go to Professor Sewell, he would be directed to administer large doses of sulphate of copper, in solution ; to Mr. Youatt, and he would be told to change the large for small doses ; to Mr. Vines, and he would be ordered to give cantharides ; to Mr. Turner, and he would be recommended to try the sulphate of iron in the animal's beverage :* lastly, let him come to me, and I should probably counsel him to make trial of barytes. Indeed, there hardly exists a medicine in the pharmacopœia of any potency that has not by one or another been tried or lauded as a remedy for farcy. Nothing can shew the insufficiency of our art more plainly than all this ; the simple truth—lying in a nut-shell—being, as I observed before, that we are no more in possession of any *specific* remedy against farcy than we are of one against

* Mr. Turner's prescription has been given in another place.

glanders. And in the absence of such a desideratum, we may say, as we did when on treatment of glanders, that we seem to gain more by a tonic and astringent or stimulant plan of proceeding than by any other treatment. In fine, if we do but examine the various remedies which have, with any colouring of "cure," been from time to time held up to us, we shall find that the majority of them are of a description possessing these properties.

TONICS, then, and such as are known to be serviceable in glanders, are in general the most likely remedies to prove useful in farcy. I do not mean to assert that it is a matter of indifference whether for farcy we prescribe *copper* or *iron* or *mercury* or *barytes*. At the same time that I believe tonic and diuretic properties to be the leading requisites for a remedy for farcy to possess, I believe that some medicines possessing these virtues, either one or both of them, are to be preferred to others. As for *specifics* or antidotes for farcy, we certainly know of none. It is the circumstances of farcy so often assuming and continuing in a *local* form—confining itself to one hind (or fore) limb, of the *cutis vera* being its seat, and of the constitution, so long as it remains untainted by absorbed virus, being disposed to take on healthful action; I say, it is these several circumstances that enable us to arrest the course of the disease as well as to remove any *sequelæ* of it, which may annoy or interfere with progression; and though perhaps, after all, topical applications, and exercise, and regimen altogether, have had a good deal of influence in working this amendment, yet, should the patient at the time happen to be taking any medicine, the amendment is commonly ascribed to that, and the medicine henceforth goes forth to the world as a *specific for farcy*. In this way may we account for the number of "specifics" we have had, first and last, for farcy beyond all other diseases; many medicines having got names as "curatives" when future trials of them have shown that the real curative agent has been the VIS MEDICATRIX NATURÆ powerfully operative in a sound condition of the constitution.

SULPHATE OF COPPER, DINIODIDE OF COPPER, SULPHATE OF IRON, MERCURY, IODINE, CANTHARIDES, BARYTES, all have their advocates, as remedies for farcy, as well as for their being

remedial in glanders. In regard to their exhibition, the directions already given for their administration in glanders will equally apply here ; it being understood, as a general rule, that it is seldom expedient to prescribe any one of them—most of them being of a *tonic* nature—before the inflammatory action has been pretty well subdued in the farcinous parts through antiphlogistic agents ; and that, in prescribing them, we should take care that the doses are not such, either in quantity or through repetition, as may tend to injure the general health of the animal, it being an object rather to support than depress. With these general observations I shall leave the selection of the remedy, and the dose, and the manner in which it is to be given, to the discretion of the practitioner, prepared as he is to undertake this part of the treatment by the directions already given in the case of glanders.

HURTREL D'ARBOVAL, after informing us that at the French veterinary schools preparations of sulphur and antimony, in combination with bitters and tonics, are considered the most efficacious remedies in farcy, makes the very suitable comment on such reports, that we no more possess any *specific* treatment for farcy than we do for any other disease ; adding, to confine our prescriptions to the *same* therapeutic agents, is not the way to increase our knowledge of the best mode of treating farcy. On the contrary, says this writer, the treatment ought to be varied, not less on account of the *stage* of the disease than in respect to the *cause* that has given rise to it, to the idiosyncrasy of the patient, his age, condition, &c. The same authority sagaciously enters his protest against the employment of internal remedies of a kind or in a dose likely to prove irritating to the mucous lining of the alimentary passages.

LOCAL TREATMENT in farcy, is of as much or, perhaps, of more consideration than constitutional means. In glanders, as was observed on a former occasion, we are, in respect to the extent and nature of the local disease, as it were, working in the dark : we know neither the precise condition nor the exact situation of the ulceration, and, consequently, run a risk of using some improper dressings, or applying them to some improper places ; whereas, in farcy, all the local disease occurring under our cognizance, we prescribe topical remedies suited to

the inflamed, tumefied, ulcerated, scirrhus, or other condition of the limb or diseased part, according to the requisites of the case.

So long as the tumefied parts continue hot to the feel and evince tenderness on pressure, and the patient—supposing a limb to be the seat of disease—halts much upon it, such evidences showing the presence of inflammation, it is unquestionably our duty to continue an antiphlogistic treatment. We will say, the patient has been well purged—has been, perhaps, blooded, and is still on low diet, and taking daily as much walking exercise as his farcinous limb will bear. In their inflamed condition the best application to the cords of farcy buds is a refrigerant or evaporating lotion; with this they ought to be sponged often enough to keep the surface (the hair) *wet*, the object being to repel or disperse the swellings. On this account this is to be preferred to fomentations and poultices: indeed, as for the latter, upon the limbs we have no means of securing their application.

As soon as all heat and tenderness have subsided in the buds—supposing that, instead of softening and suppurating, they evince a disposition to diminish and grow harder—we must alter our treatment of them. We must use lotions of a *dis-culent* character, or, in fact, any applications, liniments or ointments, having the effect of causing absorption of the swellings. Of this description are, *mercurial ointment* and *camphor, iodine ointment, blistering liniment* or *ointment*, &c. Indeed, when there appear signs of hardening and approaching insensibility in the buds, a blister is by far the best application; and, for my own part, I am very fond, in cases such as these, of using the *acetum cantharidis*: dipping a painter's brush in the blistering essence, and applying it after the manner a painter does his paint, upon the tumefactions; tying the horse up afterwards, or putting a cradle on him; and after an interval of twenty-four hours, sponging the blistered parts with warm water; an operation that should be repeated daily so long as any moisture or issue appears upon the surface. "Sweating blisters," like this, need not interfere with the patient's regular exercise; and as soon as one has "worked off" another may be applied; the repetition being regulated as well by the condition of the skin as by the demands of the case.

In cases in which no impression can be made upon the indurated buds, either by iodine or other ointment, or by blisters, it is a practice with some veterinarians to score them, or rather the skin in which they are enveloped, with the firing-iron. CHABERT, a French veterinarian, suggested that we should extirpate them : and D'ARBOVAL has adopted the farriers' practice of old, as being preferable when the situation of the buds admits of it, of destroying them by caustic. "Many of our common farriers," writes Gibson, "use arsenic or corrosive sublimate, after opening the buds, putting a small quantity into each, which answers in cases where there are but few, and these not situated near large blood-vessels, joints, or tendons. This they call *coring out the farcy*." In excising the buds, D'Arboval cautions us to be careful to cut away all the scirrhous cutis round about them, since, if left, it might engender a disposition to ulceration ; and afterwards he recommends that the wounds be seared with the actual cautery. Buds that are superficial admit readily of extirpation ; such, however, as are deep seated can only be safely or with any prospect of success, excised before they have spread into and become incorporated with the contiguous tissues.

In the majority of cases of farcy, however, it happens that, instead of diminishing in size and growing harder in consistence, the buds plump up and become soft, and at length turn into *pustules* : and once a pustule formed, it will ripen and burst, and turn into an ulcer. As soon, therefore, as we perceive that it is out of our power to prevent the suppurative stage, it becomes our duty to contribute all we can to its promotion. For this purpose, fomentations may be used to the parts ; poultices likewise, could we manage to apply them. The patient's diet also must be improved in this stage ; he should no longer feed on mashes, but have scalded oats, carrots, turnips, linseed, &c. When the pustules are ripe, some practitioners make a point of opening them ; others suffer them to burst and discharge their contents spontaneously. The old or farriers' mode of opening ripe farcy buds is with the actual cautery, the heated *budding-iron* ; and it is a practice still in vogue with many very respectable veterinary surgeons. In this manner the contents of the pustule are, as it were, *fried* by the

red-hot iron, while its base and interior altogether is destroyed, and the result is a slough, followed commonly by a superficial ulcer of larger dimensions than the original pustule, and presenting a healthy granulating surface; and this ulcer is, in the end, under judicious management, very often got to heal. Should we suffer the pustule to burst of itself, we may still cauterise its base with the budding-iron; or, if we prefer it, we may rub it with pencillated lunar caustic: at all events, some caustic or strong escharotic dressing will be demanded; without it we shall never obtain what we so much desire—a healthy granulating action. The bottom of the ulcer once cleaned out, dressings of various kinds, depending upon its aspect—healing or spreading, sloughy, stationary, &c.—will be required by it afterwards: commonly, mild escharotic applications answer best, though, at times, stimulant or astringent ones appear preferable; in short, the selection of a dressing must be left entirely to the judgment of the practitioner. For my own part, I like water or spirituous dressings better than greasy ones, and have ordinarily observed the best effects from such as these:—*Solutions of lunar caustic, of the sulphates of copper and zinc, and of alum; and the tinctures of benzoin and of myrrh with aloes.* The *nitric acid lotion* is an excellent dressing for sloughy sores; and the *solution of chloride of lime* an admirable one for such as secrete fœtid or offensive matters, The ulcers should always be cleaned, and have any hairs shooting over their edges trimmed off, preparatory to their being dressed of a morning: and it tends to the preservation of them in cleanliness, and promotes their healing tendencies as well, to besprinkle their surfaces, immediately after dressing them, with some absorbent powder, some powder that will imbibe the discharges, correct any acrimony in them, and at the same time have some effect in restraining their production; and I know of no one that answers all these ends better than common (baker's) flour. It should be made as dry as possible before being used, and may, when required to be additionally astringent, have some powdered *alum* mixed with it. As a change, on occasions we may employ for the same purpose powdered *bark* or *calamine*. Mr. Turner recommends a strong *solution of sulphate of iron* to be plentifully applied over the

ulcerations, and well rubbed into the sound parts likewise.* And Mr. Blain has found *sea-water* and saturated *solutions of common salt* good dressings; and speaks in favorable terms of *sea-bathing* for farcinous limbs, aided by "daily doses of sea-water."†

THE GENERAL TUMEFACTION of the farcinous limb must be counteracted, as advised before, by internal remedies and by exercise; there not being in general any occasion to remit either on account of the pustular or ulcerated condition of the swollen parts: indeed, as for the ulcers, they will be benefited by anything that tends to lower any inflammation there may be remaining in the limb, and that at the same time has the effect of reducing the size of it. Unless, however, we succeed early in the attack in effecting a decided reduction in the tumefied limb, it is not often we shall find ourselves able to accomplish more than a partial diminution of the general tumefaction when once the suppurative and ulcerative processes have become established, even supposing the disease in other respects to be proceeding favorably: when such, however, proves not the case, instead of growing less the limb will grow larger; showing us that our plan of treatment, whatever it may be, is not one adapted to the exigencies of the case, and consequently ought at once to be changed, supposing we are to continue treatment. But too frequently, however, in such cases as these, in order to save needless expense on the part of our employer, and our own credit as well, it will present itself as our duty to recommend to his master that our patient's days be summarily put an end to.

THE TUMEFIED LYMPHATIC GLANDS, in farcy as well as in glanders, will require treatment. By some French veterinarians their extirpation has been recommended with much assurance of success in farcy, notwithstanding the notorious failure of a like operation in glanders. M. Maurice, veterinary surgeon to the First Regiment of French Artillery, has not hesitated to assert that a "cure" in farcy may be effected by the extirpation and cauterization of the glands, providing they be in "a sound condition." For the disease in the hind limbs we are directed

* See Mr. Youatt's Lectures, in 'The Veterinarian' for 1832.

† Op. cit., at p. 218.

to excise the *inguinal glands* ; for farcy the back, loins, or flanks, the glands in the flank : and for farcy in the fore limbs, neck, and shoulders, the *axillary glands*. M. Maurice makes mention of three hundred cases of farcy cured by such operations. And Renault has informed us that the practice has proved successful at the Veterinary School at Alfort.

Were there any sound reasons for supposing farcy to be, even on its first appearance, a *local* disease, undoubtedly we should not only be warranted in undertaking such formidable—or, if not formidable, painful—operations as these, but blameable if we did not have immediate recourse to them : when, however, we come to find we have too much reason for concluding that by the period of time at which the eruption shows itself in the thigh or elsewhere, the virus is absolutely in the system, how can we, in the face of such conclusions, perform operations of the kind, or even put credence in such accounts as have just been stated ? I no more doubt that horses with farcy have recovered *after* such operations than I do that others have returned to health after taking copper or iron or barytes ; between the *post hoc* and the *propter hoc*, however, there is all the difference in the world. It is absurd to think of extinguishing a disease proved to be constitutional by the extirpation or destruction of tumefied lymphatic glands and farcy buds.

The treatment proper for the enlarged glands is the same, in the various stages of disease in them, as has been recommended for the farcy buds : endeavouring, in the first instance, by refrigerant and evaporating lotions, to abate inflammation in them, and so to effect their repulsion ; and, secondarily, when they come to lose their heat and tenderness, to apply blisters over them. It is in vain to try to “bring them forward” to a state of suppuration, like the ripening farcy bud : they are hardly ever known to take on the suppurative action.

By pursuing such a course of treatment as has been pointed out, we not so very unfrequently succeed in patching up the ulcerations and getting rid of the corded swellings in which they originate, and at the same time in so far reducing the size of the farcinous limb as to render the patient (his general health and condition being good) capable of undertaking work ; indeed, it is advisable that he should do so, since under the operation

of slow or moderate work it often turns out that his limb experiences, by degrees, further reduction, and that his health and condition by generous feeding improves. All, in fact, is likely to go on well as long as the animal experiences no return of his disease or fresh attack of it: should he do so, in the *same* limb or part even, it will much lessen the chances of his second restoration; and should he do so in some *other* limb or remote part of his body, above all in the head, wearing the aspect of approaching glanders, we may bid adieu to any hope of recovery; it is pretty certain, then, that farcy in its worst form, or that glanders, before long will manifest itself. Even, however, when during treatment no relapse happens, when the patient has, in a manner answering our warmest expectations, recovered the use of his limb, and with it renewed health and strength; even, I say, then, does it but too frequently happen that at some remote period—and especially at a period when from any cause the patient's system is thrown into a state of irritation or derangement, or is labouring under depression or debility of any kind—the disease returns, and returns in a more aggravated or malignant form than before, and in the end consumes its victim. The following case, extracted from Professor Peall's work,* is excellently illustrative of this:—

A horse had been “severely affected with farcy,” of which he “was cured;” and he remained well, “perfectly sound, for more than a year. At this period, being then about ten years old, he was castrated, and appeared to be going on remarkably well after the operation; when, on the eighth day subsequent thereto, he broke out with the *button farcy* over the greater part of the surface, and, though he struggled for a time with this formidable disease, yet it proved eventually to be a breaking up of the constitution; which, but for the operation alluded to, would in all probability have remained sound for a considerable time longer.”†

The treatment of a case of farcy, no less unfortunately for ourselves than for our patients and their masters, is but too apt to “drag its slow length along” beyond the period pre-

* Op. cit., at page 266.

† This case may be regarded as somewhat analogous to the one to which I have referred in a note at the bottom of page 251.

scribed by reason and conscience for it to last : the owner of the horse gets weary of professional attendance, and the veterinary surgeon experiences both a sense of weariness and dissatisfaction at finding the progress towards amendment, if any, of so tardy a nature. The patient is not in that hopeless condition that calls for the knacker ; he is by no means fit, or *safe* even, to go to work, and he is “ eating his head off,” and taking or using medicine, the expense of which he may never repay. What is to be done in such a dilemma as this? Should the season of the year be favorable, *pasture* offers a resource likely to prove serviceable, certainly pleasant, to the animal, and one that the medical attendant will, with satisfaction to himself, if not with benefit to his patient, recommend. A change of diet, from dried to green and relaxing food, living in the open air, and the constant exposure of the farcinous limb to a lower temperature than that of the stable, together with the walking exercise the animal is from time to time taking upon it, all has a tendency to do good, and on occasions proves of eminent service. In particular, *salt* marshes have been regarded as beneficial, and apparently not without reason. Whenever and wherever the patient may be turned out to grass, he ought to have no companions save any as might happen to have on them the same disease as himself : it would be highly imprudent, nay, full of danger, to suffer him to run with healthy horses. In situations where or seasons when pasture cannot be procured or resorted to, it is desirable to soil the patient in his box : vetches or rye, or, in the winter season, carrots or Swedish turnips, become a desirable change of diet for him. There arrives a period, in cases of this protracted and indolent stage of farcy, when the resources of medicine seem to be exhausted, nothing that is administered doing any good, and this is a period when the disease is judiciously “ left,” as our common phrase goes, “ to nature,” to take, uninterfered with by art, its spontaneous course.

CRITICAL NOTICES.

"I like the title of this work, inasmuch as it implies imparting to us that knowledge of medicine which relates to the distempers incident to the horse, together with the distinguished characteristics by which they are denominated, and subsequently the treatment by which they are relieved. The volume before me is quite free from what is contemptuously termed 'the jargon of science,' and perfectly comprehensible by the most uninitiated understanding. In fact, it is nothing more than a plain statement of cause and effect, in very impressive but very convincing language, and in the true spirit of natural philosophy."—*New Sporting Magazine for May*, 1834.

"To say that we have been pleased from the perusal of Mr. Percivall's 'Systematic Treatise' would be a most inadequate and imperfect term to apply: we have derived much valuable information, and can therefore confidently recommend it to the notice not only of the Profession, but to all Sportsmen and Gentlemen interested in the Horse."—*The Sporting Magazine for July*, 1834.

"But we must close our notice of this work by strongly recommending it to our brethren, few of whom can afford to live *without a horse*. Nothing can put in a clearer point of view the march of intellect than the contrast between the old books on farriery and the modern works on veterinary medicine. The sarrago of receipts and nostrums is now changed into accurate and scientific anatomy and physiology; while the therapeutics of the stable are reduced to even greater simplicity than in the wards of an hospital. To such perfection, indeed, has veterinary medicine arrived, that we had rather trust our body in the hands of a modern horse-doctor than in those of an ancient physician. An Hippocrates and a Sydenham were excellent observers of disease, for they watched them throughout all their phases of increment and decline, with little interference on their parts. A Coleman and a Percivall can also accurately observe the trains of morbid phenomena in horses, aided by the lights of human and comparative anatomy and physiology, while they can apply the most energetic and successful remedies."—*Medico-Chirurgical Review, July*, 1834.

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